Telephony.

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W. H. Graffis, 2d Vice-President H. D. Fargo, Secretary-Treasurer

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Newspaper Publicity.

It is an encouraging sign that Independent telephone men are now making greater use of newspaper publicity than has been noticeable for some time. In all parts of the country we find that progressive managers are proving by actual test that it pays to advertise their growth and their service. The news of the success of their methods is spreading to the other, more conservative exchanges, and producing a beneficial activity. No only do the companies get the benefit of returns from their advertising, but, perhaps because the managers of newspapers are not less endowed then other business men with the tendency to judge progressiveness from its evidence in their own affairs, they receive increased attention in the reading pages after carrying out advertising campaigns.

This effect was notably illustrated a few days ago in connection with the West Virginia Independent telephone convention, held at Parkersburg. Mr. A. C. Davis, general manager of the West Virginia Western Telephone Company, with headquarters at Parkersburg, has always been a believer in extensive and persistent advertising. The newspapers are thoroughly aware that the business of this company is large, and that it is worthy of all the attention which should be bestowed on the principal organization furnishing so important a public service as that of the telephone. When the convention came, special care was taken to furnish the newspapers with every facility for obtaining all the news of the meeting, which, at the same time, was extensively advertised. The result was that all over a considerable portion of the state of West Virginia, including not only the territory of the West Virginia Western Telephone Company, but other Independent companies which adopted the same policy, the Independent telephone convention received an amount of publicity which can hardly fail to have been a by-product of the meeting equal in value to all its other results.

The rapid extension of Independent long-distance service is a feature which especially demands that type of publicity which only newspapers can give. In most of the towns served by Independent systems, people are slow to begin to call for long-distance connections, and especially to those points reached by new circuits. It is hard to get them started. A single general notice will not suffice. The impression that the Independent line will reach a certain town must be strong in a subscriber's mind at the time

he is ready to put in a call for that particular distant point. He must not only be sure that the town can be reached, but that he can reach the desired party promptly, and enjoy satisfactory conversation with him over a good line. This requirement considerably widens the scope of the information which advertising must give to be successful. An excellent illustration of what is required in the way of copy is furnished in a statement put forth by the Independent company of Maryville, Mo. It not only advertises that it has good lines to Kansas City, but states that there are over 17,000 Independent telephone users there who may be reached over the long-distance lines. To the business man who has never used the Independent telephone line this advertising at once gives the assurance that he can not only connect with Kansas City, but that he will find the party he wants.

Effective advertising of long-distance service must not only advertise the local company, but the company at the other end of the wire. Why would it not be a good plan for an exchange to take up neighboring Independent systems connected by long-distance lines, one by one, and publish in the newspapers a classified summary of subscribers, giving the number of wholesale houses in each line of business, etc. In any such attempt care must be used to avoid creating the impression that the telephone company is advertising retail firms in distant cities to its subscribers who deal with the home merchants. But it would seem that there is something in the idea worthy of development.

About two years ago the Inter-Ocean company, at Buffalo, issued a special directory of grain merchants intended to stimulate conversations between firms of this class, and the newspapers played a prominent part in giving general publicity to the recent "Long-Distance Day" in the same territory, but no broad general scheme for advising the local subscribers in considerable detail of the real extent of possible long-distance connections which would directly appeal to them has been carried out in any territory.

Of course, advertising can only be an entering wedge. It is a device to attract attention. The telephone company, like any other firm, can at the very utmost only hope for a trial order. It then lies especially with the operating department to give the service which will back up the strongest claims which can be made in the advertising. This condition can only be produced after effective work by the construction and maintenance departments, and even then future business will depend to a great extent upon the personal interest which the manager shows in a new customer. It pays to follow up business houses, and show them how they could make money by using the long-distance telephone instead of the mail or the telegraph, and be sure that a single unsatisfactory experience does not nullify the effect of all the expensive preliminary work.

Destruction of Telephone Poles by Insects.

Insects play a most important part in timber destruction. The injury done is generally underestimated as their depredations go on gradually, but forcibly, attracting little observation. When they bore into the timber they open up air chambers and channels which makes it easy for rainwater to seep in, and thus keep the wood in a moist condition. Fungous spores floating through the air are enabled to germinate with greater rapidity and with increased effectiveness, and the decomposition of the pole consequently is materially hastened.

Several years ago the Forest Service co-operated with one of the large telephone companies in Georgia and Florida to experiment with various preservatives in protecting the butts of telephone poles from decay. These preservatives were simply painted upon the wood, and of course did not sink in to any great depth. A recent examination made of this pole line showed that wherever the preservative had entered the wood no destruction due to insect attack had taken place, but where the wood was unprotected, such injury was frequently quite serious. Poles in which the preservatives had seeped through a crack were often more or less fluted on the surface, that is, the oil saturating the wood in the immediate vicinity of the crack protected it from the attacks of the insects. It is essential, therefore, particularly in the warmer portions of the United States, to protect timber from the attacks of insects as well as of fungi, if the longest life is to be secured.

The Spirit of the Work.

There is a tremendous difference in the ways men look at the same things. One enjoys the bright, beautiful day with simple, hearty enjoyment. Another makes himself miserable thinking that it can not last long—that it will rain. The happiest earthly state of human existence can be turned into wretchedness, if you confine your thoughts to what it lacks.

Were we to believe the evidence of the spirit shown by some men, we would be led to think that they were greatly abused. Some act as if they believed the company is dead wrong, the management poor, and the workman not given half a chance. Others talk about having missed their calling, wishing that they had entered this or that other line of work, in which they are sure they would have done better.

But there is a spirit of freedom in the work which it is the privilege of men to enjoy and which they may have if they will. We used to know a railroad engineer whose actions emphasized this spirit more because of the contrast which they afforded. At home, at church, on the street, he was very quiet, made no advances, was reserved, though not difficult to approach. But on the engine he was a different man, working with an ease and freedom which it was a pleasure to see. A two weeks' vacation was not the paradise to him that it seems to many. And he was a good engineer.

We have known other men in the same and other callings, who had that same spirit of work, and always they were highly esteemed by their employers and associates. To get out of joint with your work always spoils its quality, while to fall into the spirit of the enterprise and throw yourself heartily into its accomplishment means success and happiness for you.

The 1909 West Virginia Convention

By R. M. Dalzell

On May 27 and 28 the West Virginia Independent Telephone Association held its fourth annual convention at Parkersburg, and it proved to be the most successful meeting ever held in the state.

Parkersburg, historic on account of the Blennerhassets, is a beautiful city of 20,000 located on the Ohio river, and in many ways suitable for a convention. Its citizens make it so; they displayed a hospitality which is their inheritance from Virginian ancestors, that made the delegates feel at home throughout the entire city.

When Hon. W. B. Pedigo, mayor of Parkersburg, delivered his address of welcome at the first evening session, he expressed the cordiality which was exemplary of the writer's assertion, but is now difficult to describe.

On Thursday morning, our first day, the reception committee was active, meeting all trains and aiding the delegates to get properly cared for; then the committee on registration and credentials saw to it that they all registered and were bedecked with a very unique souvenir, the gift of the local company; namely, an oxidized silver medal suspended from an artistic pin, and bearing the impression of the West Virginia Western Telephone Company's building and its name. These souvenirs, at first pinned on the lapels of the delegates' coats, were intended to be worn as watch fobs after the convention.

Delegates and Others Interested in Independent Telephony, Who Were Present at the West Virginia Convention.

The Chancellor Hotel was headquarters, and here most of the telephone men stopped; but lack of accommodations forced many elsewhere.

As to the exhibits, much could be said. Twenty-five manufacturers' displays covered the entire needs of the telephone man, from poles to the latest inventions in transmitters and receivers.

At 1:30 p. m. Thursday the convention was formally called to order by President J. Walter Barnes, of Fairmont.

President Barnes, in his annual address, reviewed many events of national importance which have recently advanced and strengthened the position of the Independents. Referring to local conditions, he said:

"The progress within the state has been one of great development. The field is being rapidly developed, and notwithstanding the great business depression, every company of which we have any record shows a large increase in the number of subscribers and revenue tolls, etc., and a great improvement in construction of toll lines and betterments to plants. Other lines of business have been forced to economize in order to meet the running expenses, but the Independent movement has gone steadily forward.

"During the year, if it had not been for this Association, one of the largest plants in the state would have passed under the control of the Bell telephone company as a sub-license company, namely, the People's Telephone Company of Monongalia county. Negotiations had progressed so far that the Bell auditors were taking an inventory of property preparatory to taking it over. When the information was obtained, a movement was set on foot by which the Consolidated Telephone Company, the West Virginia Western Telephone Company, the National Telephone Company and the Wadestown Telephone Company, Pt. Marion Telephone Company and the Mt. Morris Telephone Company, combined together and purchased the property in order to save this connecting link between Pennsylvania and West Virginia to the Independent interests."

Roll call and reports from members of the Association brought out the facts that in every section of the state a steady growth has gone on, many toll lines have been built, and general prosperity exists in all quarters. One manager startled the convention when he reported a 50 per cent increase of Bell telephones in his district. He said that last year the Bell company had two telephones in his district, and this year it had three; its last installation having been placed in a barn having no windows.

In the evening Mayor W. B. Pedigo formally welcomed the delegates to his city in a graceful speech. His words reflected the warm feeling the "Parkersburgers" hold for the "Independents." (The West Virginia Western has 3,200 subscribers and the Bell 500, a 6 to 1 ratio.)

President Barnes responded in well-chosen words.

Mr. H. D. Critchfield, whose name appeared to talk on the "Independent Telephone Situation," had telegraphed his

inability to be present. Two extemporaneous speeches, one by Mr. Cyrus Huling, a prominent attorney of Columbus, Ohio, and the other by Mr. Wm. A. Wynne, manager of the Raleigh (N. C.) telephone company, filled out the program and made the first evening session one of the best.

Mr. Frank L. Beam, president of the Ohio State Association, concluded the evening with an address on "Telephone Associations," of which an abstract follows:

"The first Independent telephone development in Ohio was during the year 1894; the following year development became more rapid, and on the 29th of April, 1895, the Ohio Association was organized in the city of Columbus. To this organization is due the very extensive system which now covers Ohio, also the efficient service, both local and long distance, which is enjoyed by the people.

"From the beginning down to the present time it has been a fight between the Independents and the monopoly. The local service, while important, is only one phase of the telephone business; long distance service and connections have been greatly increased and perfected through the efforts of the state Associations. The one idea of joining all the Independent companies together in the common cause has been the keynote of every state organization, and has been the important factor of our success.

"At every Association meeting I have attended during the past, I have noticed that the delegates bring their problems and difficulties; sometimes it is a local matter, others it is some question that affects the entire system. Here these problems and difficulties are discussed, the real points are found; if it happens to be a mere local matter, they find how some other company has met and overcome that obstacle in a satisfactory way.

"The educational side of the Association meetings must not be overlooked. Here we are able to get a general view of the entire working field, and to see what others by their progressive methods have been able to accomplish, and in turn to give to others the benefit of our experience.

"By this method of tracing down our weak points, mapping out an effective remedy and placing the work of correction in the hands of those who know how to reorganize and rebuild, the continued betterment by such a plan year after year has brought about a tangible result of which I maintain these associations are the stimulus and backbone.

"At our convention in Ohio last March we held a two days' session; the second day was given up to the exchange managers to discuss the various questions that confront all operating companies. I was impressed with the earnest and intelligent way all problems were discussed.

"The entire range of economic management for the benefit of the stockholders, efficiency of service for the benefit of the subscribers, was handled in a most interesting and beneficial manner.

"The difficulties that have come with the growth of the Independent telephone system are familiar to all of you, but I might briefly mention a few of the important matters that have been discussed, elucidated and effected by associations:

"First. The education of the different companies to stand together in a common cause against the monopoly.

"Second. The encouragement given to local companies, both financial and educational, concerning the greater development of local exchanges, rural service and adequate long distance service. This has brought about such rapid development that the Independent companies in several states are serving more people to-day than the Bell company did in the entire United States prior to 1895.

"Third. In these associations all of the great economic problems have been effectively handled, such as rates, depreciation of plant, uniform accounting, efficiency of service.

"Fourth. In these associations the state has been divided up into working districts or subdivisions. This has aided development, and the district meetings have been of much service in getting the many stockholders personally interested in their own company and in the Independent telephone business at large.

"Fifth. Through these associations we have been able to educate the local companies in the necessity of purchasing equipment from strictly Independent manufacturers. These manufacturers have made our business possible in the first place, and we should stand by them. Also the local companies have been made to realize that their success has not been entirely due to their own efforts or to the personal efforts of their own company, but also to the development of adjoining Independent companies, and to the long distance companies to whom they are largely indebted for their success, and for that reason are under moral obligations, in addition to their legal contract to be and remain Independent in every sense of the word.

"Before I close I wish to say a few words in regard to the recent decision of Judge R. W. Tayler of the United States Circuit Court of Ohio dismissing the petition of the United States Telephone Company, asking for a permanent injunction against the Central Union Telephone Company and the A. T. & T. Company, restraining them from interfering with the 99-year contract of the United States Telephone Company and local Independent companies for long distance service.

"In the opinion the lack of jurisdiction of the court over the case is stated, also *in obiter* that it is the opinion of the court that the contract in so far as it gives an exclusive right to complainant is void as against public policy. The statement is purely *obiter* and has no effect upon the holdings of the state courts upon the very points declaring in two cases already won, that the contracts are perfectly valid. We brought this suit in the United States court merely to avoid a multiplicity of suits, but as the court has not jurisdiction it simply means we will have to fight these cases individually, and we have the precedence of two suits directly in point in our favor. We anticipate little trouble in regard to the breach of these contracts with local companies, but wherever such is the case we are determined to fight the case through the courts of last resort in the state.

"One thought above all I want to leave with you for your earnest consideration, and I trust action in the near future, and that is the matter of county consolidation, and consolidation of greater than county area if possible and convenient.

"From my personal observation I believe to strengthen the Independent telephone system in this or any other state there should be fewer companies. This can be brought about only by consolidation, taking in as large an area as possible, even the entire state if possible. This would secure more economic management, more efficient service, more stability to the securities, and in no way would lessen the number of stockholders or their interest and influence."

On Friday morning Mr. W. C. Handlan, general manager of the National Telephone Companies, gave a very able talk, although informal, on "Good Construction," and brought out how very much cheaper it was to build well and thus forever keep down maintenance cost.

"Proper Rates for Rural Service" was a prepared paper read by Mr. A. H. Doudna, manager of the Belmont Telephone Company (a part of the National system). After the reading of this paper an open discussion followed. Many questions were asked Mr. Doudna and different phases of the subject were gone into. The paper will be published in a later issue of TELEPHONY.

The main topic for the afternoon session was dispensed

with on account of the absence of Mr. John A. Howard of Wheeling, who was scheduled to speak on "Legal Obstacles to Bell consolidation."

Reports of committees, miscellaneous business and election of officers followed in regular order. The newly elected officers are:

President, John A. Howard, Wheeling; secretary, R. M. Dalzell, Wheeling; treasurer, A. C. Davis, Parkersburg; first vice president, J. H. Wise, Cameron; second vice president, Leander Moore, Wadestown; third vice president, E. K. Hertford, Charleston; fourth vice president, Hugh Amos, Burnsville; fifth vice president, H. H. Henry, Point Pleasant; executive committee; A. C. Davis, J. Walter Barnes, W. C. Handlan.

A resolution, after a discussion brought out by A. C. Davis' able address on "Compulsory Connections," delivered at the morning session, was offered and adopted. It reads as follows:

"Be it Resolved, That the Executive Committee be authorized and empowered to take whatever action is deemed by them necessary to create public sentiment against the proposed enactment of a compulsory connection law in this state, and to take any further action to combat, before the public and at the sessions of the legislature, any legislation such as the aforementioned, or anything of like character that is calculated to do injury to the best interests of the Independent telephone companies in West Virginia."

During one of the afternoon discussions it was brought out that there are between 6,000 and 7,000 Independent stockholders in West Virginia.

At 9 o'clock Friday evening the banquet hall was thrown open. It presented a beautiful and brilliant appearance, the long tables extending around the sides of the big room, being profusely bedecked with flowers and ferns. White easter lilies were placed at intervals along the entire table and entwined in these lilies were small electric light bulbs, red, white and blue.

Above the heads of the toast master and speakers of the evening there was a very novel display of the "Shield." It was a large pane of glazed glass in which was imbedded the shield about 4 ft. square in beautiful rich colors; this was lighted from the background and presented a unique spectacle.

Following are the names of those who responded to toasts:

A. C. Davis, toast master.
Cyrus W. Huling, "Why Are We?"
W. A. Wynne, "The Sunny South."
J. Walter Barnes, "Our Guests."
Frank L. Beam, "The Suburbs."
W. C. Handlan, "The Shield."
Chas. Brooks Smith, "The Press."
Hon. W. D. Pedigo, "Parkersburg."
B. Mason Ambler, "As We See It."
Hot Air, "By the Angels of Commerce."
Cross Talk, "By Everybody."

Throughout the evening a hidden orchestra discoursed all the latest popular airs. The banquet closed at midnight, at which time the banqueters arose to their feet and sang "Auld Lang Syne." A photograph was taken, but it proved a failure.

One thing upon which was laid especial stress both before and after the convention, was publicity in the press. Wednesday, before the convention we endeavored to have every newspaper in the state give us a prominent article, and in nearly every case they printed our program in full. In this way the entire state became aware of our gathering simultaneously.

We are indebted to Mr. Charles Brooks Smith, who so handsomely carried out this idea in the Parkersburg district during our two days session. Mr. Smith is the representative of the Pittsburg *Dispatch* in West Virginia and acted, at the request of Mr. Davis, as special correspondent for the "Dispatch News" during our sessions.

This press publicity is a very strong factor to telephone companies and is a feature of the business which the "Independents" do not fully appreciate.

This same idea, in a little different way, was very cleverly carried out by Mr. Davis of the West Virginia Western Telephone Company. He had printed and distributed over the entire city large placards bearing the "Shield;" above the Shield appeared the words, "We use (then the usual wording on the shield proper)" and below it "Convention May 27 and 28." It is interesting to know that out of five hundred business houses, railroad stations, hotels, etc., there were only two subscribers who would not grant permission to post the placards in their establishments.

A big banner, hung in the lobby of the Chancellor Hotel, on which the interesting fact was made known that there are 46,609 Independent telephones in use in the state, to 15,535 of the Bell, showed the great growth of the Independent business. These figures were from the reports of the Census Bureau at Washington.

In the Assembly Hall one of the delegates suspended a large club over the speakers' stand with a card attached, reading: "A. C. Davis' Big Stick."

In conclusion, we may say that our convention was a great success and we feel as though we had accomplished much toward furthering the Independent cause.

One of Iowa's Challengers for Youngest Operator Honors.

Mr. W. E. Geiger, superintendent of the Citizens' Telephone Company of Spencer, Iowa, has under his supervision a charming little miss who for the past year has been operating the telephone switchboard at Greenville, located in the residence of her parents. This board has nine farmers' lines connected to it and ten town subscribers. The farmers' lines have from 15 to 30 subscribers on each line and Miss Beatrice French, the 6½-year-old operator, whose photograph is reproduced herewith, has memorized the ringing code of each of these lines. The service given by this youthful operator is said to be excellent, and all the subscribers are well satisfied.

Not Very Tall, But a Very Lively Young Operator.

New Use for Pole Changer.

A manufacturer of telephone equipment recently advertised a pole changer in a somewhat indefinite manner, and received from a reader a request for one which he desired to use to replace 15 foot poles with 25 foot poles, as required by an ordinance recently passed by the village authorities.

Artificial Telephone Lines

By P. E. Erikson

In the development of telephone apparatus it often becomes necessary to make ringing and transmission tests under conditions similar to those which obtain in actual service. In the earlier days of telephony such tests were made on existing lines which, for the purpose of obtaining

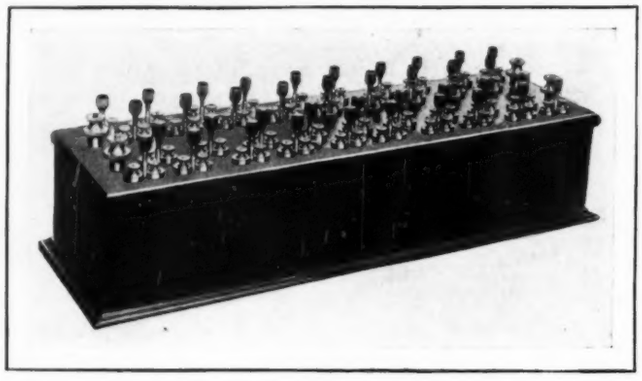


Fig. 1. Ten Mile Artificial Cable.

the desired length and also to have the two terminal stations accessible at one point, were looped back and forth between two points, as, for instance, two central offices. This method of securing a line upon which to make tests was not altogether satisfactory. It was very laborious and, in restoring these lines to regular service, errors were apt to occur, causing unnecessary confusion and delay. Incidentally, the looping of lines for testing purposes sometimes introduced cross-talk and, in the case of open wire lines, the leakage was uncertain in amount, all of which more or less affected the reliability of the results obtained.

With the increased use of the telephone, and the correspondingly increased complication of the apparatus and circuits, there arose the necessity for studying as accurately as possible the transmission losses due to each portion of the equipment. As in telephony, it is desired to converse between points at a distance, it was a logical development to measure the superiority or inferiority of any piece of telephone apparatus, or of any portion of the circuit by accurately and conveniently the losses or gains, it was necessary to design adjustable standards which should serve as a means for comparing the actual telephonic transmission of circuits.

One of the early forms of artificial line consisted of four resistance coils, connected two in series to represent each line conductor, and having approximately the same resistance as the line which it was supposed to represent. The capacity of the line was represented by a condenser, connected across the middle of the line thus formed.

It is evident that an artificial line of this kind does not truly represent the conditions of an actual line, where the capacity, resistance and inductance are uniformly distributed over the entire length; nor does it comply with the two fundamental requirements which must be fulfilled by an artificial line, if it is to take the place of a physical line—namely, (1) its initial sending end impedance should be for telephone currents the same as that of the physical line; (2) its attenuation constant should be equal to that of the physical line. In order, then, to obtain the desired result, it would seem to be necessary to arrange for a distribution of the capacity and resistance in such a manner as to approach that of the physical line, and yet render the manufacture of the artificial line commercially possible.

Two methods of constructing an artificial cable naturally suggest themselves; first, to use a type of construction similar to that in a rolled paper condenser, where the two sheets of tin foil, for instance, would represent the cable conductors, and the capacity between the sheets would represent the mutual capacity of the cable. The other method is to "lump," as it may be termed, the resistance and capacity. The artificial line to be described is of the latter form of construction. A mile of No. 19 gage cable, which has a loop resistance of about 90 ohms and a mutual capacity of .060 of one microfarad, may, it has been found, be represented by four resistances, each of 22½ ohms, two connected in series on each side of the line with a condenser, having a capacity of .060 m. f., bridged across the middle point. As in actual cable circuits the self-inductance is very small and the insulation resistance very high, it is sufficient for all practical purposes to consider only the capacity and

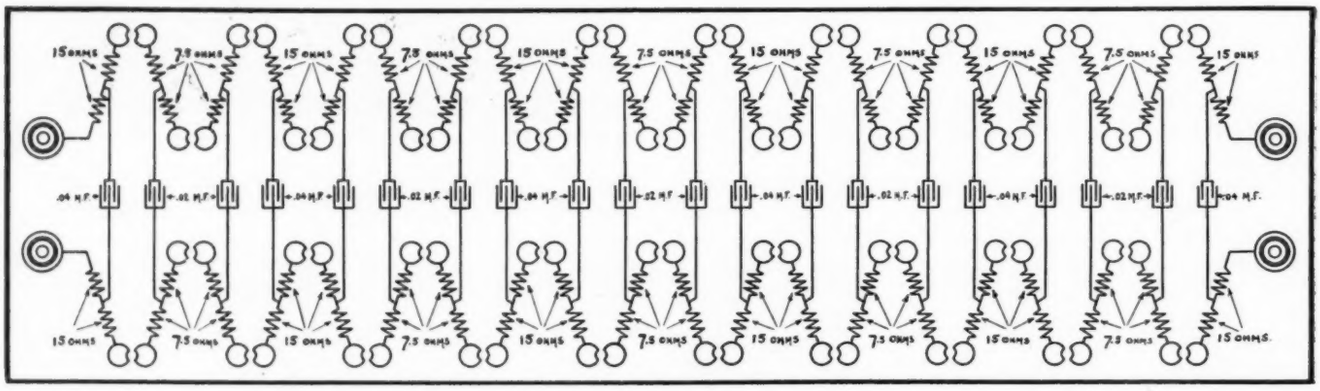


Fig. 2. Wiring of Ten Mile Artificial Cable.

the number of miles which the introduction of a certain apparatus or circuit increased or decreased the possible range of transmission, and, as No. 19 B. & S. gage cable was largely used, this came to be adopted as the unit in transmission experiments. In order, therefore, to measure conductor resistance. An example of one of the earlier types of artificial cable is shown diagrammatically in Fig. 2. Fig. 1 shows an exterior view of the box assembly. As will be seen, it consists of the equivalent of ten miles of No. 19 B. & S. gage copper wire cable, the electrical con-

stants of which are: Resistance, 90 ohms; capacity, .060 microfarad per loop mile. Each mile unit is here divided into two parts, separated by a plug, one part being equal to one-third, the other equal to two-thirds of a mile. The capacities of the fractional parts of the mile are proportioned so as to make the capacity. 060 microfarad per mile. It will be noted that the removal of a plug on either side of the section opens the circuit so far as the resistance of the line is concerned. The condensers remain, however, shunted across the line.

In the design of later models of artificial No. 19 gage cable boxes it was found to be advisable to adopt the more generally accepted mile resistance requirement of 88 ohms rather than 90 ohms, the capacity requirement being maintained at .060 microfarad per mile. Generally speaking, it has been desirable to limit the capacity of any one box to 32 miles of cable, so as to meet more satisfactorily certain mechanical conditions of construction. A cable box of this type is shown, diagrammatically, by Fig. 3, a general view of the exterior of the box being shown in Fig. 4. It will be noted that the mile unit in this case is not subdivided, experience having developed the fact that the general use for which this type of cable box is designed does not require fractional parts of the mile. It should be noted in this connection that, although for the sake of simplicity in the diagram (Fig. 3), all of the condensers and resistances for the 4, 8 and 16 mile sections are shown as units, they are, in fact, each made up of combinations of the 1-mile and 2-mile sections. This arrangement provides for a more uniform distribution of the capacity and the resistance throughout the entire length of the cable. Each section of this type of cable, as well as that of the 10-mile cable previously described, is independent of all the other sections, all terminals being brought out to blocks on the hard rubber top of the box, where, by means of plugs, they can be connected one with another in any required combination or, if the necessity occurs, any single section may be used alone.

Except where the wires pass through terminal blocks, the sections are completely enclosed in a metal casing in order to provide against inductive interferences of one with another. One or two binding posts, or "ground connections" (*G*) on the cover, connect directly with all the metal castings.

The resistance coils are wound non-inductively, and with wire sufficiently large to avoid any liability to undue heating with the heaviest current that they are at any time likely to carry.

The condensers are in general made of silvered mica. In addition to the promise of greater permanency which they afford, such condensers possess another important advantage; they do not vary with changes in mechanical pressure as do other kinds of condensers.

The table below gives the results of some tests which

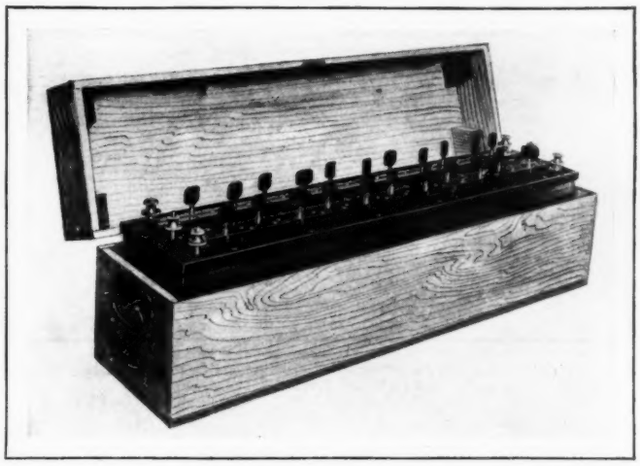


Fig. 4. Thirty-Two Mile Artificial Cable in Its Carrying Case.

have been made on silvered mica condensers of the type employed, to ascrtain their properties, with special reference to their capacity values at telephonic frequencies (about 900 periods per second), the phase angle at the same frequency and their insulation resistance. It will be noted that the values indicate the silvered mica condensers to be very satisfactory in these respects. These tests were made by the National Bureau of Standards, Washington.

	Capacity at 20° C.		At 30° C.	Phase Angle	
Nominal Value	Ballistic	A.C. 900 p.p.s.	A.C. 900 p.p.s.	900 p.p.s.	Insulation Resistance Megohms
.00500 mf.	.00508 mf.	.00493 mf.		*	3,900,000
.00500	.00512	.00492		*	690,000
.00500	.00510	.00489		3′ 10″	6,200,000
.01000	.01015	.01005		2′ 40″	3,000,000
.01000	.01015	.01002		0′ 40″	
,01000	.01017	.01001		3′ 30″	
.01500	.01508	.01486		1′ 50″	
.02000	.02065	.02003		1′ 50″	
02500	.02524	.02486	.02490	1′ 30″	605,000

*Could not be detected with certainty. With so high a frequency on such small condensers the phase angle cannot be determined much closer than 30″.

In the actual construction of the artificial cable, the pre-

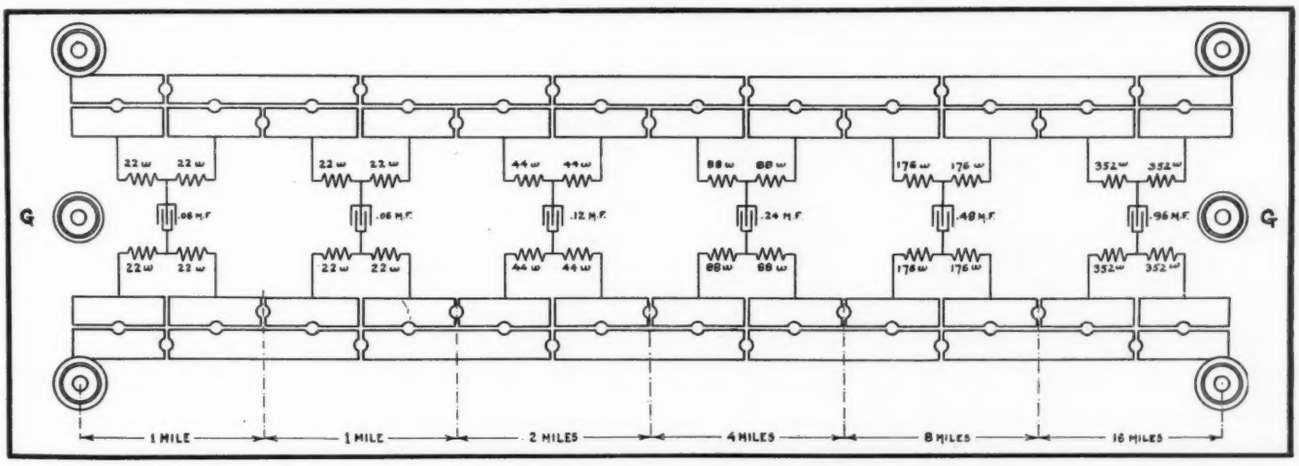


Fig. 3. Wiring of the Thirty-Two Mile Artificial Cable.

pared coils and condensers are assembled in various ways according to the requirements of each particular case. In general, however, the coils are placed horizontally in a frame support with such separation between them as to

avoid any appreciable interference. Only occasionally, where extra heavy wire is specified and the space thereby limited, is it necessary to protect the individual coils of a section. In such cases they are separately surrounded with a heavy tinfoil or other metallic shield connected, in common with the section shields, to the ground terminals. The condensers are usually placed horizontally just below the coils of the particular section to which they belong.

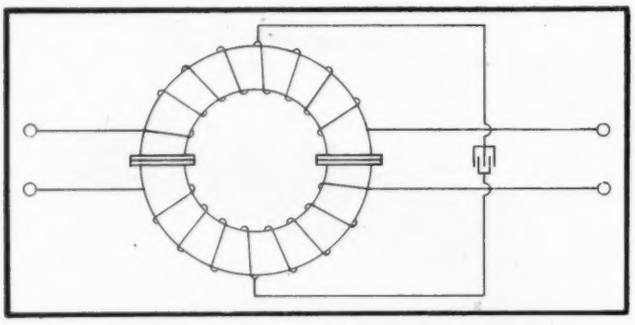


Fig. 5. Inductive Resistance Coil and the Condenser Used in the Artificial Aerial Line.

In the construction of artificial aerial lines the only additional feature which must be taken into account is the inductance, which is to represent the uniformly distributed inductance of an open wire circuit. The resistance coils, used in connection with the artificial aerial line, are wound inductively and are distributed over the sections of the line represented in order to simulate the required inductance per mile. The coils are, furthermore, of the toroidal type so as to reduce inductive disturbances when they are, of necessity, mounted closely together for the sake of compactness in the design. Fig. 6 shows, diagrammatically, the arrangement of an artificial aerial line designed to represent a 600 mile No. 12 N. B. S. gage metallic circuit. The constants of this line are: Resistance, 10.4 ohms per loop mile; mutual capacity, .0085 microfarad per mile; and inductance, .0037 henry per mile. It is made up of five 20-mile and five 100-mile sections, arranged between connecting blocks (numbered 1 to 48, inclusive), on each side of two insulated center connecting bars *BB*. The resistance coils are connected between the outer blocks in the manner shown, the condensers being bridged across the middle points of the inductance coils as indicated. Fig. 5 shows in detail the method of winding the resistance coils for the 20-mile sections and the manner of connecting the condenser to its middle points. For the 100-mile sections five of these resistance coils are connected in series and five condensers are bridged across the line in parallel to obtain the desired capacity. The line terminates at blocks 1 and 25 at one end and at blocks 24 and 48 at the other end. By means of switches and the center bars any desired length of line may be secured. Fig. 7 shows the exterior of the 600-mile artificial aerial line in its carrying case.

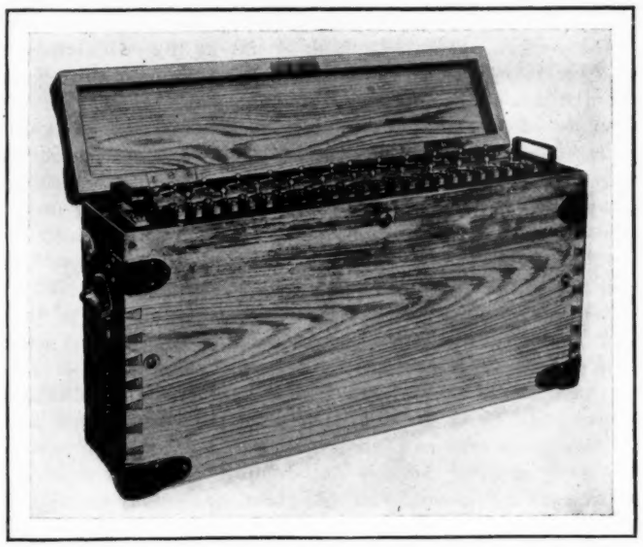


Fig. 7. Six Hundred Mile Artificial Aerial Line in Its Carrying Case.

An instrument which may be classed among the artificial lines, is the so-called Universal Receiver Shunt. This instrument, which is used in evaluating the transmission equivalents of a telephone line, is shown, diagrammatically, in Fig. 8. It takes the form of a dial rheostat with a contact lever *LL*, extending across, and simultaneously making contact at two diametrically opposite contact points. A bipolar telephone receiver is connected to the binding posts marked *REC*. A series of impedance coils, *a*, *b*, *c* - - - are connected between the contact points as indicated. These impedance coils are so adjusted that the total or resultant impedance of the circuit terminating at the binding posts marked *SET* remains constant and equal to the impedance of the telephone receiver, no matter in what position the lever *LL* is on the dial. In other words, if an electromotive force, supplied by a transmitter or a high frequency alter-

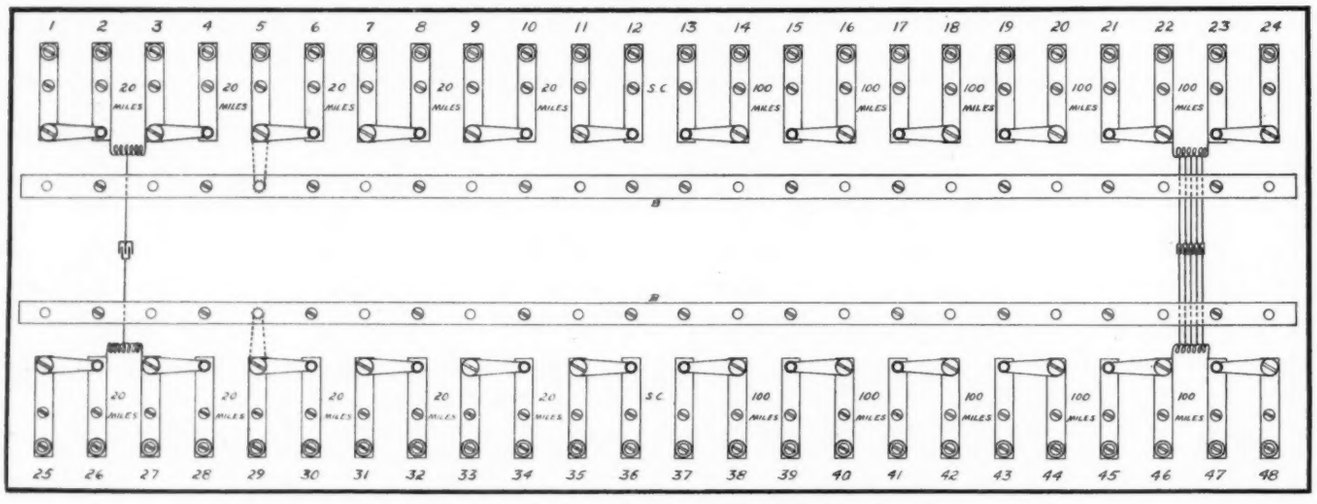


Fig. 6. Wiring of a Six Hundred Mile Artificial Line Box.

nator, is impressed upon the terminals marked *SET*, this electromotive force will remain constant when the lever *LL* is rotated. It may be stated that when the lever stands on the contact points marked *O*, the contact device indicated by *T* opens automatically, and the telephone receiver is then connected directly across the terminals marked *SET*. The contact device *T* is normally closed when the lever stands in any position except the zero position. The principle of the shunt arrangement described insures that, of the total current I_M, entering the device through the terminals marked *SET*, the portion I_T which passes through the receiver is

$$I_T = I_M \epsilon^{-ax},$$

where ϵ=2.71828, the base of the Naperian system of logarithms; a=the attenuation constant per mile for No. 19 B. &

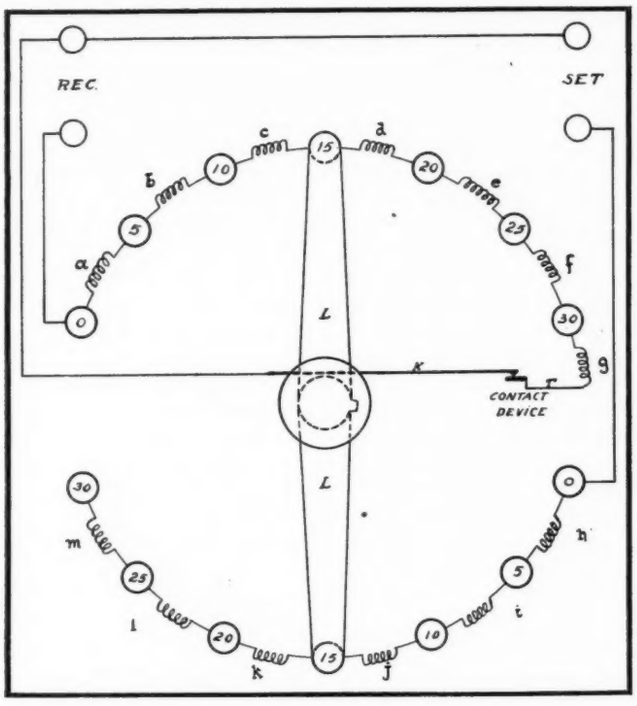


Fig. 8. Wiring of Universal Receiver Shunt.

S. gage cable, and x=the number indicated on the contact points on which the lever rests (5, 10, 15, etc.).

Fig. 9 illustrates how the receiver shunt may be used in evaluating transmission equivalents of telephone lines. A standard common battery substation set is shown at each end of the line, the set indicated as "Sending Set" having its receiver terminals connected to the *SET* terminals of the receiver shunt. From the description of the principle of the receiver shunt it is then evident that if the telephone line is, for example, 15 miles (No. 19 B. & S. gage cable) long, and the lever of the receiver shunt is turned to the contact point marked "15," then the same volume of sound will be produced in the receiver of the receiver shunt as in the receiver at the "Transmitting set" by the high frequency alternator shown as connected across the line. Obviously, the transmission equivalent, if unknown, may be evaluated in terms of miles of No. 19 B. & S. gage cable by merely turning the lever of the receiver shunt until the same volume of sound is produced in both receivers. The transmission equivalent of the line may then be read directly from the dial of the receiver shunt.

It should be mentioned in this connection that, in making the observations, it is necessary to have the sending set and the receiving set located at the same station, and that, for this reason, the line under test must be looped.

As stated at the outset of this article it is of the greatest importance that the artificial line should have the same initial sending end impedance, and the same attenuation constant as the physical line which it represents. The impedance offered to an alternating current at the sending

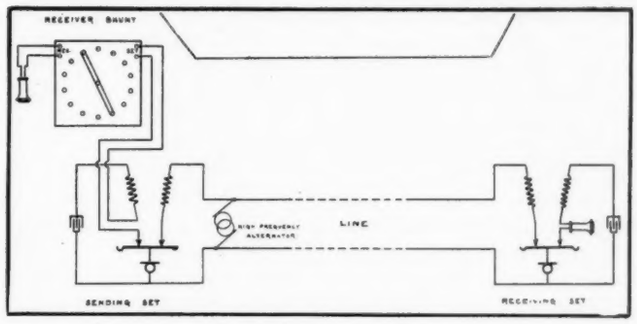


Fig. 9. Use of Receiver Shunt for Determining the Transmission Equivalent of a Line.

end of a line, terminated in such a manner that no reflected waves are returned from the receiving end, is generally known as the initial sending end impedance to distinguish it from the impedance offered at the receiving end. If any uniform circuit carrying an alternating current the initial current is I_0 and the current at a point X miles distant is I_X, then

$$I_X = I_0 \epsilon^{-ax};$$

where ϵ=2.71828, the base of the Naperian logarithms and a=the attenuation constant. The attenuation constant is a complex quantity, the real term of which denotes the shrinkage in magnitude, while the imaginary term denotes the phase of the current at a point X relative to the initial point. In telephony we are more particularly interested in the "real attenuation constant," as it may be called. Fig.

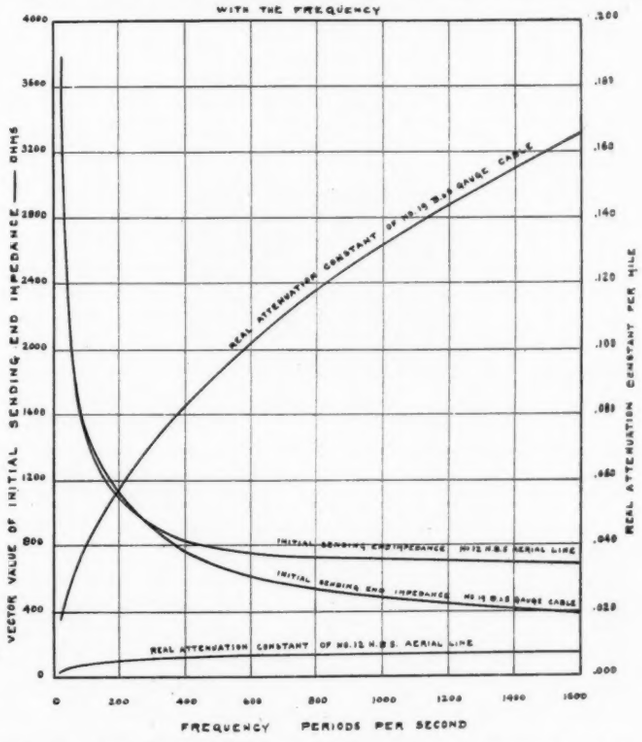

WITH THE FREQUENCY
VECTOR VALUE OF INITIAL SENDING END IMPEDANCE — OHMS
REAL ATTENUATION CONSTANT PER MILE
REAL ATTENUATION CONSTANT OF NO. 19 B.&S. GAUGE CABLE
INITIAL SENDING END IMPEDANCE NO. 12 H.B.S. AERIAL LINE
INITIAL SENDING END IMPEDANCE NO. 19 B.&S. GAUGE CABLE
REAL ATTENUATION CONSTANT OF NO. 12 H.B.S. AERIAL LINE
FREQUENCY PERIODS PER SECOND

Fig. 10. Curves Showing the Variation of the Attenuation Constant and the Sending End Impedance with the Frequency.

10 shows, graphically, the vector value of the initial sending end impedance and the real attenuation constant at frequencies ranging from 16 up to 1,600 periods per second for a No. 19 B. & S. gage telephone cable, having a resistance of 90 ohms per loop mile and a mutual capacity

of .060 microfarad per mile. The corresponding values for a No. 12 N. B. S. gage aerial line are also given for the same range of frequency. The constants for this aerial line are: Conductor resistance, 10.4 ohms per loop mile, mutual capacity, .0085 microfarad per mile, and inductance, .0037 henry per mile. It will be noted that the real attenuation for the aerial line is considerably less than that of the cable. The initial sending end impedance, while coinciding approximately with that of the cable for frequencies up to 100 periods per second, is, on the other hand, higher than the impedance for the cable, remaining practically constant for frequencies ranging from 800 to 1,600 periods per second.

In order to see how nearly the artificial cable fulfills the fundamental requirements set forth above and illustrated by the curves, some measurements were made on a fifty mile length of No. 19 B. & S. gage artificial cable made up of five of the ten mile sections previously described (resistance 90 ohms per mile, capacity .060 mocrofarad per loop mile). An alternating current having an electromotive force of 20 volts was impressed upon the terminals of the line. Current measurements were made by means of a Duddell thermo-galvanometer at the point where the current entered the cable and again at a point 20 miles from the initial point. The table below gives the results obtained for three different frequencies, 500, 1,000 and 1,500 periods per second.

Frequency, Periods per Second	INITIAL LINE IMPEDANCE			ATTENUATION CONSTANT
	Real Term	Imaginary Term	Vector Ohms	Real Term
1500	285	—280 i	395	.161
1000	348	—343 i	483	.135
500	492	—485 i	690	.0925

These values check very closely the computed values shown in Fig. 10. The properties of the artificial cable of the type described may therefore be said to approach, with sufficient accuracy for testing purposes, the physical cable which it represents.

A Letter from Mexico.

Durango, Mexico, May 18, 1909.

My Dear Bob: I am sorry you haven't as much time to read as I have to write, for I am sure that it would afford us both great pleasure. In the languorous comfort of this land of irresponsible indolence, it is impossible for me to exert myself sufficiently to imagine you in a big American League baseball city rushing hither and thither in a vain, I was going to say, attempt to furnish several thousand telephone subscribers five second telephone service—or is it three second? Here we—(notice that I say "we," I have been here just a month)—we do not take the trouble to measure anything in units as small as seconds, particularly time! Life in Mexico is not so strenuous a proposition as all that; to live we need not consult fashion or break our necks to pay the grocer and the landlord. We can dress in a flour sack and lie down under a banana tree and live happy ever after—unless we are fussy and want our fruit sliced with cream.

In Durango the largest and finest stores close for an hour at noon, while all hands go home for the much written about "siesta." There are no rapid fire catch-as-catch-can restaurants, where you bolt a sinker on the arm of a chair and expect it to dissolve later on in a cup of disguised coffee hastily swallowed. In Mexico competition does not force us to such extremities—we live and others let us live. The Bell company ought to do well down here, hadn't it?"

Although they are under grave suspicion and I have often suspected them of it myself, you have often forcibly protested that your operators in the States do not go to sleep at the switch. Even if they don't, I am sure that I have waited fully twenty seconds for them to answer. But in Mexico we might wait fully twenty minutes and there would be nothing said about it. The voice of the Spanish-Mexican operator is so softly sweet that it is worth waiting for—its dreamy melody is the best thing for nerves that I have ever tried. The only case I ever heard of where a man called the operator down in Durango was once when a fellow came down from a Bell-exclusive town in the States and, thinking he was home, swore at her. One afternoon, when it wasn't too hot, they took him out with a horse thief and hanged him!

Delays in getting your parties on the telephone in Mexico are unnoticed, in fact they are often really desired; for the Mexican gentleman, the person who uses the telephone the most, would much rather talk to the affable senorita operator than with his client or customer!

It is quite probable that final research will some day prove that Gaston and Alphonse of ancient history were Spanish-Mexican and not Parisian-French; for politeness was certainly patented in Durango and perfected on the telephone. Listen to this: it is typically true to the life! Senor Gomez is calling up Senor Rodriguez on a matter of urgent and pressing moment. The telephone is the kind that the Bell used to have before the days of competition—you have to grind it to disturb Central. After fifteen minutes of vigorous grinding, the beads of perspiration began to glisten on Senor Gomez's brow. Then he was rewarded by the dulcet tones of the operator.

"Ah! Good morning, my dear Miss Central, how goes it with you today?" It takes possibly ten minutes to assure him that she never felt better in her life, after which the wheels of commerce begin slowly to turn.

"The favor of putting me in connection with number 100 is humbly desired."

"Yes, sir; with much pleasure!" responds the little Mexican operator in a voice saccharine with soft Spanish. Then if the line is not "ocupado" and if the party "humbly desired" is not out picking strawberries, they finally get together exactly like this:

"This is Senor Gomez. With whom do I speak?"

"With the house of Senor Rodriguez, at your service."

"Is Senor Rodriguez at home?"

"Yes, sir. Do you desire his presence at the telephone?"

"I do. Kindly say to him that Senor Gomez desires the pleasure of communication with him over the telephone for just one little minute."

Then Senor Rodriguez himself takes up the taffy.

"With whom do I speak?"

"With Benito Gomez, at your service, sir. Good morning, friend Rodriguez. How are you this morning?"

"Well, I thank you. And how are you and your lady?"

"Well, I thank you. My compliments to your wife and family. Listen, friend Rodriguez; I beg your pardon for the molestation, but I was wishing to speak to you about ———." And again the wheels of commerce begin slowly to turn. After it is all over they ring off like this:

"A multitude of thanks, friend, for your information."

"No cause for thanks at all, my dear sir!"

"And a thousand pardons for molesting you so early in the morning." The clock had just struck ten.

"It has been a pleasure to chat with you."

"Well, adios, and a thousand thanks!"

"Adios, may it go well with you!"

Do you wonder that it takes twenty minutes to get Central? You are lucky to get her at all!

A very good friend of mine is owner of what is considered a large exchange in Mexico. He connects something like 500 subscribers in a city of about 32,000. That doesn't stack up very well with your 10 per cent development, does it! And many of his subscribers are on government leased lines which extend to ranches and military posts far out in the environs. But when you get well acquainted with the Mexican peons, who constitute a large percentage of the voting population, you do not wonder that there are only 500 telephones to

30,000 people. A peon is so poor that he couldn't pay for a telephone if it didn't cost a cent.

Perhaps you don't know it, but once I put in several weeks soliciting for a telephone company up in the States. So I struck my Mexican friend for a job slamming gates, confidently expecting that this town ought to be good for a dozen new orders a day more or less. It turned out to be less—about a dozen less. But, you see, I had just landed then; I was green from the States. Bone headed aggressiveness stuck out in front of me like my sun-burned nose. I was just fresh enough to want to reform Mexico. But Mexico soon reformed me. In the first place, only about one Mexican out of a hundred could understand my college Spanish—and that one was a good guesser. In the second place I couldn't understand more than one Mexican in a thousand—and that one talked in signs. Finally, however, I got so I could tell a Mexican dog to go back and lie down in Spanish so he could understand me, but I came pretty nearly getting hydrophobia learning. After that I got so I could say telephone in Spanish so a Mexican could understand me, and by the way he nodded or shook his head I could tell whether or not he wanted one. But they never nodded. Still, I developed some fairly good prospects. There was a dentist who agreed to take a telephone if I would let him pull out enough of my teeth to pay for it the first year. I have often heard new solicitors back in the States say that subscribers came as hard as pulling teeth, but this was the first time it ever struck me that way. A local hardware man agreed to trade me a second-hand warming stove for a telephone, but demurred when I countered by offering to make the trade for palm leaf fans! A saloon keeper said he would have one for six months if I would promise to trade with him exclusively—I think I would have beaten him at that, for no one could patronize him six months exclusively and live! I threw up the job two days after I expected to be paid.

When I handed in my resignation to my friend he didn't seem greatly surprised—in fact he rather seemed to be expecting it!

"I am frankly willing to admit," I said to him, "that my percentage of new business is very low, but even at that you can't complain at the cost per contract!" I looked him hard in the eye, for he hadn't paid me a cent. He yawned in that acquired graceful Mexican-Spanish way of his, but made no reply. "I should like," I continued, "to enter your construction department."

"Well," he said, "I'd be glad to have you. My native linemen are on duty about fifteen hours a day. They are always willing to make themselves generally useful. They dig holes, set poles, run wire, collect bills, sweep out the office, mow my front lawn, clean out my stables, take care of the horses and do the night operating. Of course, if you come down here from the States to compete with native labor, you must be willing to ———."

"O, surely," I interrupted. "How much is there in it?"

"I pay my men $20 a month and board."

"John," I said, "I thank you for your offer, but I believe that Mexican labor is one of the very few things that can rightfully be considered a natural monopoly. I shall not compete!"

"Have a cigarette," he replied, passing the makings over to me in true Mexican style, "and tell me if that little Egyptian side show is still on the left hand side of the Midway Plaisance—it's sixteen years since I was there!"

I told him that the University of Chicago gave me my diploma on almost that exact spot six years ago. Then I went out and sent a telegram home to father. In Mexico they have a very ingenious way of forwarding English messages to the States. They number the letters of the alphabet consecutively from 1 to 26. I wrote out my message in English and the Mexican operator simply telegraphed the figures corresponding to the letters to an American operator in Texas. He sent 3-18-15-11-5, 19-5-14-4 1, 8-21-14-4-18-5-4. The American operator translated it into excellent English and when father got it he read: "Broke, send me a hundred."

My dear Bob, I do not want you to think that every city in Mexico is like Durango. Many of the larger cities have modern telephone systems operated as efficiently as any in the States. The people are progressive and intelligent and their methods of business compare favorably with our own. Possibly my pipe has been burning a little strong, but the conditions which I describe in this epistle, though a little caricatured for your benefit, are, in the main, true to the life. I am sure you understand this. Remember I am expecting to see you here almost any time, there is plenty of room for you under my banana tree, and I am ready to move over any time, at a moment's notice. Yours for a good long rest,

Oliver.

The Missouri Association's New President.

Dr. S. T. Neill, of Clinton, Missouri, who was recently elected president of the Missouri Independent Telephone Association, is a man whose connection with Independent telephony has been such as to thoroughly familiarize him with its history. Ten years ago he was the leader in organizing a company at Clinton to free the telephone users

Dr. S. T. Neill.

from the excessive rates and discourteous treatment of the Missouri and Kansas Bell Telephone Company. This company, the Missouri Union Telephone Company, of which Dr. Neill is assistant general manager, has steadily grown until it now operates in the neighborhood of 2,000 telephones in four exchanges. The company has so thoroughly covered the territory in which it operates, and given so satisfactory a service in every way, that three years ago the Bell company removed its local exchanges from this field.

Dr. Neill has been active in work for the general good of Independent telephony, and three times has been elected delegate to the annual convention of the International Association.

Among his friends Dr. Neill is known as having a keen and ready wit, and his genial disposition and sturdy character, no less than his ability as a business man and organizer, make his choice a fortunate one.

A Reliable Police Signal and Telephone System

Absolute municipal police protection is economically provided by a recently perfected patrol flash-light system. The complete outfit provides reliable means of instantly reaching any patrolman on duty, as well as the equipment for communicating with headquarters from any patrol district. Separate apparatus furnishes a most modern fire alarm

Fig. 1. General Appearance of Police and Fire Patrol Box.

system, as well as instant means for calling a patrol wagon, and a device for registering the officers' report calls on a tape at police headquarters.

The system is by no means in the experimental state, since a complete installation has been in successful operation in North Tonawanda, N. Y., for the past two years. This outfit was installed by R. Max Eaton, the general manager of the Niagara County Home Telephone Company.

The distinctive feature of the flash-light system is the addition of three powerful red lenses in the patrol boxes. A very brilliant incandescent lamp may be lighted behind these lenses by the operation of a very simple connective device at police headquarters. The lights are visible from three directions for at least 500 yards in the day time, and for miles at night. Heretofore there has been no system to call the patrolmen from headquarters, unless the officer happened to be near enough to hear his bell ringing.

In installation, patrol boxes are so located in each district that at least one light is always within the line of vision of the officer on that beat. If headquarters desires to reach any patrolman, all of the lamps in his district may be lighted to advise him to come to the telephone. The telephone part of the equipment is of the best quality. By connection through modern metallic multiple circuits, all possibilities of noisy lines or other interruptions are completely removed. An interesting test in demonstrating the apparatus is to show that the tick of an ordinary watch is readily heard over the lines.

The efficiency of the system is best demonstrated by several instances in North Tonawanda. Late one evening, a resident of the outskirts of the city telephoned the police headquarters that a suspicious character had been seen around the premises. The police sergeant threw a little switch, lighted the lights in the patrol boxes on that beat, had the officer in less than two minutes, and within fifteen minutes the burglar was safely imprisoned at headquarters. Street cars passed through this outlying locality only once in every hour, hence it would have been almost impossible to have captured the marauder by sending an officer from headquarters.

A few weeks later, a farmer drove into the city, hitched a valuable team of horses, and remained in a store only a couple of minutes. Upon his return he found that the horses had been stolen and he immediately called headquarters. The desk sergeant was in communication almost instantly with three patrolmen, and he assigned these men to roads leading into the country. One of the officers was told to watch for the team at a bridge across the canal. He caught the thief within a half minute after he reached his post.

Police and fire systems are generally so closely related that a combined signaling system is advantageous. The "Flash-Light" patrol box provides instantaneous fire alarm facilities, which may be included in the initial installation or readily added at a later time. The apparatus is so simple in construction that this change may be made in a very few minutes by the addition of a few small parts.

Turning in an alarm automatically lights a lamp calling the patrolman in that district. This stays lighted until the

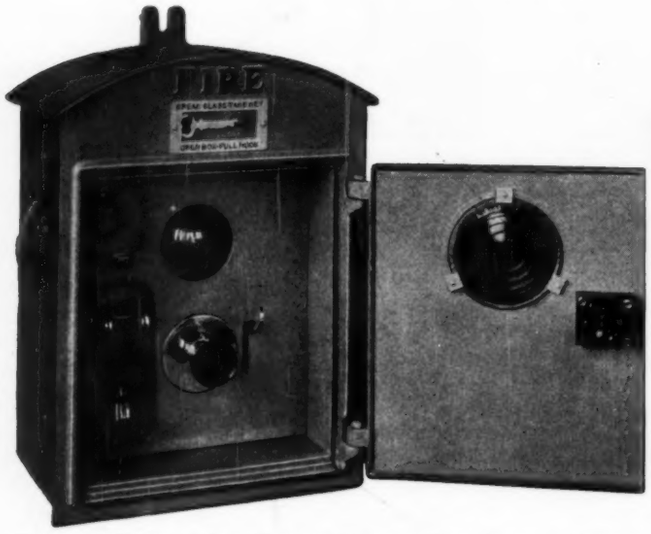


Fig. 2. Interior of Box Exposed When a Fire Alarm is Sent in or a Report Made to Police Headquarters.

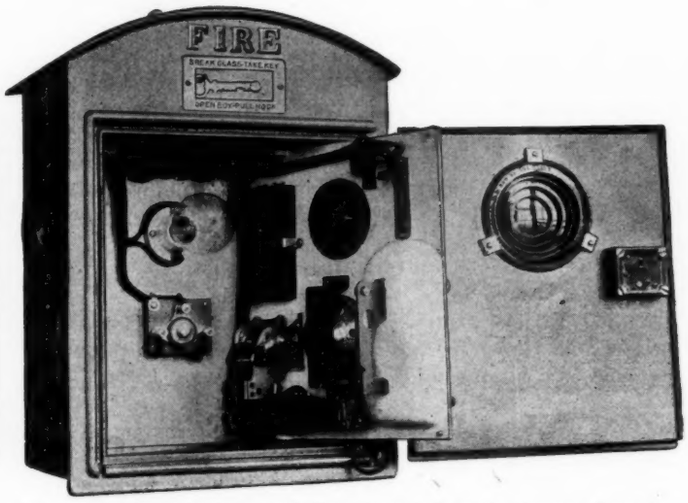


Fig. 3. Apparatus in Patrol Box, Seen When the Second Door is Opened.

fire chief replaces the glass which has been broken to obtain the key. Police headquarters as well as the fire department are notified automatically.

The illustrations show the details of the patrol box. Fig. 1 shows the general appearance of the closed box as it would be mounted. Fig. 2 shows that portion of the box that is exposed in making a report to headquarters or in turning in a fire alarm. The hook on the right has a dual purpose in providing facilities for police registration and for the ordinary fire alarm purposes. The Dean "Indestructible" transmitter and receiver, with which each box is equipped, are shown in this illustration, as well as a small button immediately above the receiver. This button is used for calling the patrol wagon.

Fig. 3 illustrates the inner mechanism exposed by opening the second door. The positions of the lamp, lightning arrester, line terminal posts, etc., are very clearly shown. All of the apparatus is very readily accessible and all contacts are plainly exposed for examination.

The entire outfit is absolutely moisture proof, and by the use of special prepared wire, difficulties from this source are eliminated. To prevent even the slightest interruption of service, the standard Dean "Indestructible" parts are used almost exclusively. Very little special apparatus is required. Hence, operating companies may maintain a patrol "Flash-Light" system without encountering the necessity of carrying an additional line of spare parts.

Up to the present time cities have been required to buy police equipment outright. Often the expenses of construction and maintenance have been extremely high. The "Patrol Flash-Light System" may be installed and maintained for the city on a rental basis—for less money than the salary of a capable city electrician.

The economic saving of this method is evident, since the telephone company already has cables all over the city. Its trained technical men build and maintain the system in satisfactory operation at a much less cost than the city could handle the work. The saving in outside construction alone is enormous.

Seven Years' Growth of the Independent Company at Eldora, Ia.

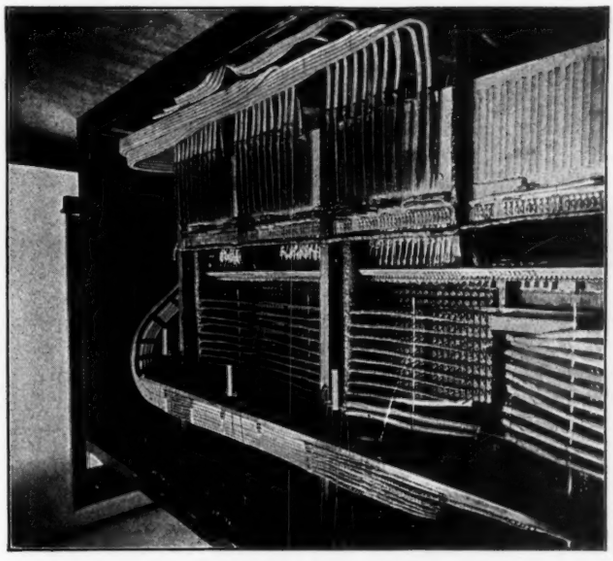
The wonderful possibilities in the Independent telephone industry which can be developed by a few energetic business men are forcibly illustrated by the accomplishment of the Eldora (Ia.) Telephone Company, and the remarkable progress that has been made by that company in a few years.

New Switchboard at Eldora.

Seven years ago Eldora was without telephone service. A few of the progressive business men who realized the necessity of the telephone as a factor in the development of their city determined to make an effort to form a Mutual telephone company and establish an exchange. There was

Exchange Building, Built Six Years After Organization.

nothing pretentious about the start. A meeting was called to determine the general sentiment in regard to the enterprise, the originators of the movement finding it necessary to borrow the grand jury room in the Hardin County court house for the purpose. But so enthusiastic were the people of Eldora for the launching of the new enterprise that at this first meeting the company was organized, and it was decided to incorporate at once. A committee was appointed to go into the details necessary for incorporation, and the activity of that committee was typical of the progressive spirit which has been shown ever since by the company it was instrumental in creating, for within two days a second meeting was called. By that time the company was such a substantial reality that another committee



Rear Switchboard Equipment and Cabling.

was appointed at once to obtain subscriptions for stock. This stock committee secured subscriptions for over one hundred shares in so short a time that, notwithstanding the length of time necessary to erect lines, install instru-

ments and a switchboard, in less than nine months—on Sept. 10, 1902—the exchange began to give service.

The growth of the exchange was so rapid that within two years it was necessary to replace the original two hundred line board and a three hundred line board was installed, this being arranged so that additional sections could be added. This provision was a proper one, for in less than a year it became necessary to add another 100-line section, and again the following year more equipment was added.

Even in the early period of its development the company made money. Through the sound judgment of its managers in selecting equipment and putting up construction of a quality which made satisfactory service possible the company prospered to such an extent that in June of 1908 the board of directors was authorized to erect a suitable building exclusively for the telephone company, and purchase a new switchboard capable of handling the present business with the speed necessary for satisfactory service, and of a type to provide for the anticipated future growth. The new building, as shown on page 683, is a substantial structure of pressed brick, and modern in every respect. The equipment of the offices, operating and rest rooms is wholly of the best type the company could secure.

The switchboard is a magneto multiple having 800 lines installed and an ultimate capacity of 1,200 lines. It was built by the Monarch Telephone Manufacturing Company, and is equipped with a number of the excellent features, such as the double clearing out drops, etc., which have made Monarch boards of this type attract favorable attention. The front and back of the board are shown in the illustration, and the simplicity of wiring, the careful workmanship and the ease with which every part can be reached are very apparent.

The city of Eldora now has an exchange of which it may be justly proud, and to president N. R. Van Avery, vice-president Thomas Larson, treasurer W. E. Rothbone, and the manager, Mr. F. E. Murphy, much credit is due for the progress that has been made. For this, in fact, all members of the board of directors have done their part. The directors are A. E. Diehl, L. B. Marks, C. A. Reaver and C. F. Stauffer. Miss Helen Hall is the secretary of the company and in this responsible position she has proved herself to be an exceptionally capable and clever business woman.

Practical Questions and Answers

Accounting Practice.

Will you kindly inform me to what account we should charge batteries that are used for the operation of telephones; and is the time that is required to install batteries in telephones charged to maintenance or operation?

We would be glad if you would give us, in detail, what is charged to maintenance, operation and construction of a magneto telephone system of 700 subscribers.

In replying to any inquiry regarding accounting problems where the actual conditions are not known, it is unsafe to endeavor to do more than to state and explain the underlying principles which should govern the work. There are so many different conditions and circumstances under which different companies are operating that the detailed plan which would do for one would not fit another. We will, therefore, try to give in a general way, only what appears to us should be considered in deciding to what accounts various expenditures should be charged.

This is a matter of the greatest importance to any business. It is most important that the books should show an accurate record of the investment put into the business, and the amount spent from time to time in maintaining that investment, as well as the true cost of operating the business.

In defining the dividing line between items chargeable to operation, maintenance, and construction, it is necessary to make an absolute distinction between material, on the one hand, and labor and sundries on the other. As a general proposition, every item of material put into use as a part of the working plant should be charged to construction, including the labor and expense cost incident to placing it there, and every item of material removed from the working plant should be credited back to construction (or plant account) at its original cost price plus the installation cost. Any shrinkage or depreciation in value realized in the meantime should be charged as "loss" to a depreciation account. The value represented by material is tangible, and the actual investment in it must be preserved intact as long as it is serving the purpose for which the investment was made. When the time comes, however, that it is removed on account of being worn out, then the investment represented has been used up in the process of operating the business, and an equivalent amount must come out of the earnings in lieu of the material which formerly represented the investment, so that the capital account is preserved intact. No company can afford to fail to definitely "label" a portion of its Surplus Earnings as a Depreciation Reserve, such reserve to be used for paying the losses represented by discarded equipment. By thus definitely setting aside the necessary amount in a Depreciation Reserve Account, the possibility of erroneously paying it out as dividends is precluded.

In following out this line of reasoning it is just as important that an account called "Plant Deductions" (covering items removed from the plant) be maintained, as it is that a Construction Account (covering items put into the plant) be kept.

There is, however, good reason for making exceptions to the foregoing plan in the case of certain items of material which wear out very rapidly, and which represent practically no junk value whatever when discarded. A few items might be mentioned, such as batteries, switchboard cords, switchboard lamps, etc. In the case of items of this nature, it will be found more convenient and practical to charge them direct to maintenance when they are used to replace worn-out parts. In this case, of course, no credit is made to the plant account for the discarded parts, as there would then be no replacement shown.

In handling labor and sundries expense, a different line of reasoning from that concerning material expense must govern. If such expenditure increases the value or the efficiency of the working plant above the figure which already represents it on the books, it is clearly chargeable to Construction,—but, if the expenditure is merely to recover lost ground such as installing telephones to replace some previously removed, etc., or in other words to bring the value and efficiency of the plant up to a point which it had already attained at some previous time, it should clearly be charged as one of the expenses of running the business.

As to separating items chargeable to operation from those chargeable to maintenance, it is well to draw the line by putting all expense incurred in repairing or replacing equip-

ment (due to wear and tear or action of the elements) into maintenance, and all other expense of conducting the business into operation.

Causes of Induction from Parallel Telegraph Wires.

Suppose a telephone line parallels for a distance of six miles the Western Union telegraph line immediately on the line of the right-of-way fence. This line contains one metallic circuit and one grounded line. Would there be induction from the telegraph line, and would this induction be sufficient to impair the working of the telephone line?

A full reply to your query cannot be made without information as to the system or systems of telegraph working employed on the wires on the Western Union line. It can be stated at once, however, that the common simplex, duplex or quadruplex methods of telegraph working, with direct current from batteries or dynamos, will cause objectionable induction in your grounded line; but the metallic line, if maintained in good condition, may be transposed so as to prevent any noticeable induction.

As regards your grounded line, the degree or severity of induction will increase with duplex working as compared with simplex, and again with quadruplex working as compared with duplex. This arises from the facts that current reversals are employed in the duplex and higher voltages in the quadruplex than in the duplex or simplex, for lines of the same total length and resistance. You are likely to find that the bells at bridged stations on the grounded line, if delicately adjusted, will respond to duplex or quadruplex signals.

The telegraph companies are now employing, to some extent, high speed and automatic systems of working which use rapid impulses with reversed polarities and in some cases alternating currents. These will cause much more troublesome induction than the systems first mentioned. They may even cause induction on your metallic circuit of a severe character and are almost certain to render your grounded circuit useless.

In case such systems are used on the telegraph lines we would recommend that you seek some other location for your line, at least 50 ft. distant, or more, rather than less. The general question of proper minimum separation is not easily treated in a general way in such a brief reply as we must necessarily make. Generally speaking, the amount of induction will increase with the distance of exposure, and it is therefore necessary, in choosing a location, to take into account the probability of future extensions of your line which will increase the length of exposure.

In the location which you propose, we believe that you will obtain entirely satisfactory service with transposed metallic lines if there are no high speed automatic systems of telegraphy in use; if such systems, on the other hand, are in use, or likely to be used in the future, we recommend some other location.

The Telephone in the Courts

Conducted by A. H. McMillan

Verbal Right of Way.

We have a grounded party line from A to B, 10 miles, and in making as straight a line as possible had to pass over about 30 rods of one man's land. We charge $1.50 per month rental for telephones on this line. We put in, under a verbal agreement, a telephone for this man at $1 per month, giving him the extra 50 cents per month off for the use of said land. No time specified. Can he now order out his telephone and make us move our poles? We have lived up to our contract agreement with him.

The reduction of 50 cents per month from the telephone rental of the land owner seems to us to be in the nature of a rental which you are paying him for the use of his land. If that is the case, your relations are that of landlord and tenant. He would accordingly have the same right to require you to move your pole that the owner of a dwelling house has to force the occupant to move. The right you have in the land seems to be a mere license, which would be revocable by either party at will. Yeager vs. Tuning, 86 N. E., 657,

Moving Poles in Minnesota.

Four or five years ago, when we built this plant, the poles were set outside the curb line by the order of the city engineer and under his supervision. The present city engineer's policy is to have all poles inside the curb line. We have moved some, where the cost of moving was small. But there are some places where it will be very expensive, and, besides, we cannot get clearance for cables on account of trees. A church was moved so that its main entrance is in front of one of our poles. This is a corner pole with a heavy cable on it. Can the city compel us to move them at our expense?

You did not state whether you have a franchise or not, or anything about its terms. It is therefore not so easy to answer this question as it would be had you given fuller information. However, as the state law of Minnesota provides that no telephone company shall construct, maintain and operate any subway, pipe line or conduit in or upon any street, alley or public ground of any city or village, without obtaining and compensating the municipal corporation for a franchise, we assume that you must have one. Revised Laws of 1905, Section 2841. The laws also provide that the use by any telephone company of public roads, etc., shall be subject to reasonable regulations by the governing body of the town, village or city. Section 2927. The question, therefore, seems to be whether the changes required by the city engineer are reasonable regulations or not. Undoubtedly the requirement that you move your pole away from the front door of the church would be reasonable, even though the church was moved to the location after your pole was. Whether a general re-setting of your poles outside the curb line would be reasonable or not, we cannot say without further information. It would depend upon what purpose the city engineer had in forcing the change. It would seem to us that such a general moving would not be a reasonable regulation.

Safety of Two-Bolt and Three-Bolt Splicing Clamps.

A lineman was engaged in erecting poles and then stringing a "messenger" wire for supporting cable. The lineman's particular duties, after the messenger wire was strung, were to climb a pole, attach himself to this messenger wire by means of a safety strap and propel himself along the same for the purpose of attaching the cable hangers. While engaged in this work, the messenger on which he was suspended in mid-air, parted at a splice about half way between the poles, and he fell to the ground, sustaining injuries. With a fellow employee, he had himself, under the direction of the foreman of the working crew, on the day of the accident, made the splice which parted. A suit was brought against the telephone company for damages, the claim of negligence being that the company had changed the method of splicing from a three-bolt clamp to a two-bolt clamp, and had permitted its foreman to direct that the splice should be made between the poles instead of at or near the pole, it being claimed that the strain would be greater at the intermediate point than at or near one of the poles.

Judgment against the company was reversed by the appellate division of the New York Supreme Court. The Court held that the fact that the foreman may have erred in judg-

ment in directing the splicing to be made midway between the poles instead of at or near one of the poles, in the absence of evidence that experience had demonstrated the unsafety of such construction so that the company should have made regulations about it, did not constitute actionable negligence. The court found no evidence in the case to show that a two-bolt clamp, properly made, did not furnish a proper and safe splice, or that it was any less safe than a three-bolt clamp. Said the court: "A safe place in which to perform the services does not require the master to superintend each step of the work of construction, to see that at all times the employe has preserved the conditions of safety."

Admissibility of Telephonic Conversation.

In Barrett vs. Magner, 117 Northwestern Reporter, 245, decided by the Supreme Court of Minnesota, a witness testified that he secured telephonic connection with the place of business of a party; that some one answered, and stated that the person wanted was not in, but would be called, and that soon thereafter another voice answered, and a conversation took place respecting a business transaction.

The conversation was admitted in evidence in view of the fact that the witness further stated that the talk over the telephone was of the same character as one occurring a few days previous in a personal conversation between the same parties.

Free Service and the Mississippi Railroad Commission.

The State Railroad Commission of Mississippi abolished what was known as free county service throughout the State, and fixes the charges which the company shall exact for service between exchanges in the same county. The Cumberland Telephone and Telegraph Company thereupon notified its manager to discontinue such service, and be governed by the rules of the commission. The manager of the exchange at Aberdeen followed the direction without knowing that the franchise of the company in that city required it to extend free county service to its patrons, but as soon as the conflict was called to his attention, took the matter up with his home office, and free county service was then re-established. A subscriber put in a call for a party outside the city and was told by the operator that he would have to pay the sum of ten cents. He refused to pay this, and she declined to give him the connection he desired, whereupon he brought suit for damages. A judgment for the plaintiff for $200 was reversed by the Supreme Court of Mississippi because the trial court submitted to the jury the question of punitive damages and allowed it to bring in a verdict to punish the company for its refusal of the connection. This judgment was reversed by the Supreme Court of the State upon the facts above stated, and because there was no showing that the operator had been otherwise than polite and courteous in her refusal. Cumberland Telephone and Telegraph Company vs. Paine, 48 Southern, 229.

Telephone News

INDEPENDENT TELEPHONE CONVENTIONS

North Dakota, Devils Lake, July 9, 10.

Pasadena May Effect Compromise With Telephone Company Pending Application for Franchise.

On May 30th it was agreed at Pasadena, Cal., to suspend operations against the Pacific Telephone and Telegraph Company for twenty days. During this period attorneys will endeavor to come to an agreement relative to the compensation to be paid Pasadena for back taxes, etc., pending final settlement of the suit. This agreement was effected after some days continued activity on the part of the city against the telephone company. Not only had cables been cut, but linemen had been prevented from making repairs on the ground, as stated by the City Attorney, that "the poles and lines of the company, being in the streets, as they are without right of franchise, are a nuisance subject to removal."

It is understood that hundreds of subscribers have been added to the system of the Home company since the city won its suit. A committee of business men has been circulating a petition to permanently oust the Bell company.

Keen Opposition to Bell Company at Salisbury, Md.

Further reports from Salisbury, Md., where there is a single telephone system, indicate that the subscribers are almost unanimous in their determination to throw out Bell telephones if an increase in rates is made. The Citizens Committee obtained signatures of over 97 per cent of the subscribers to an agreement to throw out the telephones if the former rates are not restored. The committee served a written notice to this effect upon the company.

Consolidation of Arizona Telephone Companies.

During the last week in May arrangements were perfected for the consolidation of the Flagstaff Mutual Telephone Company, of Flagstaff, Arizona, and the Arizona Overland Telephone Company. The basis of the consolidation is payment by the Arizona Overland Telephone Company to the stockholders of the Flagstaff Mutual Telephone Company for their holdings at par value in cash or the same in stock. There is a provision that the present rates of the Mutual company shall not be increased by the Overland company after it takes over the property.

Kinloch Long Distance Company to Increase Capital Stock.

It is reported from St. Louis that President Orthwein, of the Kinloch Long Distance Telephone Company, has stated that the company will increase its capital stock from $3,000,000 to $5,000,000. The additional capital will be employed for extension and development of the properties from time to time as conditions may indicate to be advisable. The company has assets of $8,364,826, its plant being valued at $7,488,373.65. First mortgage bonds outstanding amount to $4,881,000.

Mountain Toll Rates Readjusted to the Air Line Basis.

An interesting change in the methods of computing toll rates in the mountain districts has just been put into force by the Colorado Telephone Company. In a public letter signed by President E. B. Field it is stated that an elaborate study of long distance rates has been made to enable the company to conform to and maintain a uniform rate throughout the system and to put into force new rates to conform to the present condition of the plant. Formerly rates were charged on a measured mile basis according to the actual routes of the toll lines. The present system provides for charges on the air line distance between the centers of square sections of uniform area. Under the new schedule extensive modifications of rates have been made, 58 per cent of all rates having been lowered, 25 per cent raised, and 16 per cent remaining unchanged. In some cases rates have been lowered as much as 300 per cent, while

the maximum raise between two places is less than 33 per cent. In the published letter the statement is made that the company hopes the reductions will encourage a heavier use of the long-distance lines and that this, in time, will offset the loss which is anticipated as the immediate result of the change.

Mayor of Jamestown, N. Y., Wants Municipal Ownership of Telephones.

The proposed raise in rates by the Home Telephone Company, of Jamestown, N. Y., which was approved by the City Council some time ago, as mentioned in TELEPHONY, failed to receive the approval of the mayor. Mayor Carlson is anxious to give the city an opportunity to purchase and operate the Independent telephone system, and desires to hold up the new franchise until the people shall have had a chance to express their opinion on the question of municipal ownership. Steps are being taken to ascertain on what terms the plant could be purchased by the city.

New Interests Represented in Pittsburg & Allegheny Directorate.

At the annual meeting of the Pittsburg & Allegheny Telephone Company of Pittsburg, Pa., Messrs. J. A. Howard, T. N. Vance, and S. W. Harper, of Wheeling, and representing a controlling interest in the National Telephone Company of West Virginia, were elected directors.

The new board also includes the following Pittsburg members: R. C. Hall, S. P. Austin, C. C. Lee, Ralph E. Flinn, John S. Weller, John G. Splane.

After this meeting, announcement was made of the adjustment of all difficulties existing within the company and the withdrawal of the litigation that has been pending between the interests of William Flinn and his associates and R. C. Hall and his associates.

In the election of officers, J. A. Howard was made president, succeeding J. G. Splane, who, in turn, was elected vice president and general manager. S. W. Harper is elected treasurer to succeed Robert C. Hall and W. C. Handlan is elected secretary, succeeding T. G. Davis. Incidentally, it was announced that the reorganization has come about after some three or four years of steady and persistent development of the long-distance service of the company to such an extent that there is now a clear road for the more vigorous pushing of the residence telephone service in Pittsburg, which is to be made the chief object for the immediate future.

New Toll Lines from Fort Wayne, Ind., to Van Wert, Ohio.

At least the subscribers of the Independent systems using the toll lines from Fort Wayne, Ind., to Van Wert, Ohio, will benefit from the sleet storm in this section which did so much damage at the close of winter. Recently General Manager W. L. Moellering and some of the directors of the Home Telephone Company of Fort Wayne made an inspection trip over the new toll lines which have replaced the old ones damaged by the storm. It is understood that the lines have been entirely replaced, using new poles and new wire, and improved service is consequently given.

Local Comments on "Long-Distance Day."

Among the many evidences of the great success of "Long-Distance Day" in the system of the Federal Telephone & Telegraph Company of Western New York, are the following comments, made by the company's managers and others:

"Long-Distance Day was well received here. I succeeded in reaching personally or via telephone each of my two hundred subscribers."

"I think the advertising we got was worth the effort. I believe that it should be a yearly occurrence."

"Long-Distance Day received a cordial welcome here. I am absolutely convinced that the proposition is a good one."

"Long-Distance Day was a success. Those that I could not reach during the day I called up in the evening."

"The public was very much interested. The entire operating force took great interest in the work."

"The idea is splendid and is sure to bring new business.

Long-Distance Boosters at Hornell, N. Y.

Gives the company's employes an opportunity to meet the subscribers."

"If we could have Long-Distance Day two or three times a year, it would suit me."

"Rained hard all day, so had to reach all our subscribers by telephone. Our night and relief operators wore their badges to school—with the result that most of the pupils told their parents of Long-Distance Day."

"Long-Distance Day met with good success. The Bell company, since the Advance News Item appeared, has been flooding my territory with literature."

"Setting aside May 28th as Long-Distance Day was a success so far as this exchange is concerned. The employes took great interest and secured a number of hard propositions to use our service."

"Would like to see Long-Distance Day made an annual event."

The above are characteristic statements of the exchange managers and reflect their general attitude and opinions on the proposition.

Death of H. T. Cedergren, Leader in European Telephony.

The recent death of Mr. H. T. Cedergren, a pioneer in the telephone business in Europe, deprives the industry of one of its most able and conspicuous leaders. Mr. Cedergren started the first opposition to the licensee of the Bell company in Europe at Stockholm, and eventually bought up other companies and operated all the telephone exchanges in Sweden, until the government started an opposition telephone system which eventually put under its control the entire telephone business in the country with the exception of Stockholm. When the franchises of licensees of the Bell telephone com-

pany expired in Russia, Mr. Cedergren was successful in bidding for the exchanges at Moscow and Warsaw and installed mammoth switchboards, each having a capacity of 34,000 subscribers' lines in the multiple.

Mr. Cedergren was a vigorous man of striking appearance, and his successful career made him a recognized leader of the telephone industry wherever he was known.

Mr. Thomas B. Doolittle Retires from Active Telephone Work.

Mr. T. B. Doolittle was recently honored by a complimentary dinner attended by prominent telephone men from many parts of the country, the occasion being his retirement from active services. Mr. Doolittle has contributed in many ways to the advancement of the telephone industry, but his principal achievements were the installation of what is claimed to be the first exchange switchboard ever put in operation, and the invention of hard drawn copper wire. The importance of this invention was so great as to bring him the gold medal of merit awarded by the Franklin Institute.

Pittsburg Chamber of Commerce Finds Oil City Independent Service a Record Breaker.

During the recent excursion of 80 members of the Pittsburg Chamber of Commerce they were given an excellent demonstration of the efficiency of Independent telephone service at Franklin and Oil City, Pa. Connections were made to the train and travelers were not only talking after a very brief interval, but the Independent wires were kept busy during the entire time the train was at the station. In fact conversation did not cease until after the train had begun to move rapidly, as the connections were not broken until the train had got well under way.

The Question of the Tunnel Telephone Franchise in Chicago.

Possibly this week will see the close of the series of hearings on the proposed sale of the telephone rights of the Illinois Tunnel Company to the Chicago Telephone Company, which have been in progress before the Committee on Gas, Oil and Electric Light of the Chicago city council. At last week's hearing in addition to some new points brought out in argument, an important development was the presentation of the accompanying tables by the International Independent Telephone Association. Hitherto that association had confined itself to general figures of telephone development, showing a preponderance of Independent telephone stations within 500 miles of Chicago, as indicated by the census report for 1907. However, inasmuch as the merits of the whole question hinged principally upon the number of business telephones which are exclusively Independent there were selected directories from several typical cities, and results tabulated in the accompanying tables, which show a predominance of Independent busi-

	Total	Total		Duplicated Users:			Per	Business Tels. Exclusively:	
Illinois:	Independent.	Bell.	Total.	Bus.	Res.	Total.	Cent.	Indep.	Bell.
Aurora	2,243	2,668	4,911	394	93	487	9.5	301	174
Bloomington	4,084	1,152	5,236	342	166	508	9	570	155
Decatur	1,392	3,430	4,822	303	68	371	8	310	536
Freeport	3,691	1,375	5,066	142	101	243	5	646	139
Galesburg	3,544	931	4,475	194	57	251	6	407	139
Joliet	1,924	5,114	7,038	340	206	546	8	418	749
Quincy	2,084	2,580	4,664	460	151	611	13	461	259
Springfield	3,039	4,831	7,870	483	133	616	8	635	814
Streator	2,108	292	2,400	99	32	131	5.5	427	72
	24,109	22,373	46,482	2.557	1,007	3,564	8.7	4,175	3,017
Indiana:									
Crawfordsville	1,712	860	2,572	97	72	169	6.5	339	121
Elkhart	823	492	1,315	88	41	129	10	409	70
Fort Wayne	4,341	362	4,703	101	65	166	3.5	1,226	64
LaFayette	1,980	670	2,650	113	94	207	7.5	647	115
Peru	2,035	1,024	3,059	103	40	143	5	309	109
South Bend	3,469	1,194	4,663	215	83	298	6.5	853	326
Terre Haute	3,749	2,539	6,288	481	140	621	10	883	313
Vincennes	1,609	644	2,253	155	61	216	10	272	99
	19,718	7,785	27,503	1,353	596	1,949	7.1	4,938	1,217
Iowa:									
Clinton	1,905	1,936	3,841	177	122	299	8	385	310
Des Moines	5,818	7,009	12,827	965	223	1,188	9	963	1,306
Oskaloosa	1,471	234	1,705	63	19	82	5	279	88
Waterloo—C. F.	2,562	2,334	4,896	310	105	415	8.5	357	249
	11,756	11,513	23,269	1,515	469	1,984	8.6	1,984	1,953
Michigan:									
Grand Rapids	9,301	4,623	13,924	1,267	205	1,472	10.5	2,791	1,170
Lansing	2,102	1,881	3,983	214	98	312	8	416	356
Muskegon	1,497	328	1,825	155	22	177	10	523	66
Traverse City	1,721	325	2,046	133	24	157	8	280	50
	14,621	7,157	21,778	1,769	349	2,118	10	4,020	1,642
Ohio:									
Akron	3,350	2,826	6,176	462	151	613	10	678	270
Canton	4,296	2,317	6,613	358	162	520	8	537	340
Columbus	9,612	10,193	19,805	1,454	394	1,848	9.3	1,932	1,284
Mt. Vernon	1,560	598	2,158	123	41	164	7.5	186	86
Newark	3,316	1,034	4,350	220	53	273	6.5	633	79
Toledo	8,166	8,542	16,708	867	294	1,161	7.5	1,488	625
Youngstown	2,696	2,890	5,586	322	105	427	6	661	461
	32,996	28,400	61,396	3,806	1,200	5,006	8.2	6,115	3,145
Miscellaneous:									
Lincoln, Neb.	5,652	4,565	10,217	693	237	930	9	731	288
Minneapolis	15,160	14,431	29,591	3,477	457	3,934	13.3	3,235	2,387
	20,812	18,996	39,808	4,170	694	4,864	9.7	3,966	2,675
Grand Total	124,012	96,224	220,236	15,170	4,315	19,485	8.8	25,198	13,649
Percentages	56.4	43.6	100.	77.3	32.7	100		67.2	32.8

Returns from Telephone Directories in Competitive Cities, Checked by International Independent Telephone Association, May, 1909.

	Independent			Bell				—Per Cent.—	
	Exclusive.	Duplicate.	Total.	Exclusive.	Duplicate.	Total.	Total. Bus. Tels.	Ind.	Bell.
Illinois:									
Aurora	301	349	650	174	349	523	1,173	55.4	44.6
Bloomington	570	342	912	155	342	497	1,409	63.7	36.3
Decatur	310	303	613	536	303	839	1,452	42.2	57.8
Freeport	646	142	788	139	142	281	1,069	73.7	26.3
Galesburg	407	194	601	139	194	333	934	64.4	33.6
Joliet	418	340	758	749	340	1,089	1,847	41.	59.
Quincy	461	460	921	259	460	719	1,640	56.1	43.9
Springfield	635	483	1,118	814	483	1,297	2,415	46.3	53.7
Streator	427	99	526	72	99	171	697	75.	25.
	4,175	2,712	6,887	3,037	2,712	5,749	12,636	54.6	45.4
Indiana:									
Crawfordsville	339	97	436	121	97	218	654	66.7	33.3
Elkhart	409	88	497	70	88	158	655	76.	34.
Fort Wayne	1,226	101	1,327	64	101	165	1,492	87.3	12.7
LaFayette	647	113	760	115	113	228	988	76.9	23.1
Peru	309	103	412	109	103	212	624	66.	34.
South Bend	853	215	1,068	326	215	541	1,609	66.4	33.6
Terre Haute	883	481	1,364	313	481	794	2,158	63.4	36.6
Vincennes	272	155	427	99	155	254	681	62.7	37.5
	4,938	1,353	6,291	1,217	1,353	2,570	8,861	71.0	29.0
Iowa:									
Clinton	385	177	562	310	177	487	1,049	53.5	46.5
Des Moines	963	965	1,928	1,306	965	2,271	4,199	46.0	54.0
Oskaloosa	279	63	342	88	63	151	493	66.0	34.0
Waterloo	357	310	667	249	310	559	1,226	54.4	45.6
	1,984	1,515	3,499	1,953	1,515	3,468	6,967	50.2	49.8
Michigan:									
Grand Rapids	2,791	1,267	4,058	1,170	1,267	2,437	6,495	62.4	37.6
Lansing	416	214	630	356	214	570	1,200	52.5	47.5
Muskegon	523	155	678	66	155	221	899	75.3	24.7
Traverse City	280	133	413	50	133	183	596	69.0	31.0
	4,010	1,769	5,779	1,642	1,769	3,411	9,190	62.9	37.1
Ohio:									
Akron	678	462	1,140	270	462	732	1,872	60.8	39.2
Canton	537	358	895	340	358	698	1,593	56.2	43.8
Columbus	1,932	1,454	3,386	1,284	1,454	2,738	5,224	66.0	34.0
Mt. Vernon	186	123	309	86	123	209	518	59.6	40.4
Newark	633	220	853	79	220	299	1,152	74.0	26.0
Toledo	1,488	867	2,355	625	867	1,492	3,847	61.2	38.8
Youngstown	661	322	983	461	322	783	1,766	55.6	44.4
	6,115	3,806	9,921	3,145	3,806	6,951	16,872	58.8	41.2
Miscellaneous:									
Lincoln, Neb.	731	693	1,424	288	693	981	2,405	59.3	40.7
Minneapolis	3,235	3,477	6,712	2,387	3,477	5,864	12,576	53.4	46.6
	3,966	4,170	8,136	2,675	4,170	6,845	14,981	54.2	45.8
Grand Total	25,188	15,325	40,513	13,669	15,325	28,994	69,507	58.2	41.8

Users of Business Telephones at Competitive Points, as Shown by Telephone Directories Checked by the International Independent Telephone Association, May and June, 1909.

ness telephones over those of the competing systems. Interesting figures as to duplication are also contained in the tables. As these tables are made up from a check of the most recent directories, the timeliness and value of the figures cannot be over-estimated.

It is interesting to note that the Chicago Association of Commerce last week passed a resolution condemning the proposition of the Independents in general terms, implying that the Bell telephone service was quite sufficient for the needs of the business men. The Chicago *Daily News* commented editorially on this in a perfunctory fashion, saying, in substance, that this expression undoubtedly would go far toward settling the question. The *Record Herald*, however, takes a broader view of the situation, and vigorously criticizes the Association for passing such a resolution, as it evidently has done, without investigating the true situation or the facts.

Death of Henry A. Lanman.

Ohio has lost one of her ablest business men, and Independent telephony one of its earliest and strongest pioneers in the death of Henry A. Lanman last week. He died at his home in Columbus, June 5th.

Mr. Lanman, from a position as workman in the plant of the Ohio Tool Company, which he held as a young man, worked himself up to a position of prominence in many leading business organizations. Eleven years ago he was elected president of the Columbus Citizens' Telephone Company, a positon which he held until the condition of his health, and the pressure of his other interests, suggested his resignation a few months ago. He was a director of the Hayden-Clinton National Bank and of the States Savings and Trust Bank from the time of their organization, and he was also interested in the ownership and management of several prominent industrial firms.

A Complete Branch Exchange On a Pacific Coast Train.

The special train for the California Promotion Committee's visit to the Alaska-Yukon-Pacific Exposition will have a completely equipped branch exchange with two operators. On arrival at Seattle, the train will be parked at the exposition grounds, and will be the home of the members of the committee while there. Connection will be made with the Seattle exchange, so that conversations may be carried on with subscribers in the city of Seattle, and over long-distance lines directly from the train.

A Good Advertising Idea from Maryville, Missouri.

The Hanamo Telephone Company, of Maryville, Mo., keeps its service prominently before a certain class of the public by distributing a neat folder giving a concise street directory of Maryville. This is extensively used, and so much appreciated that it is permanently retained by a large

number of persons who are given copies. Leading business firms make it a point to provide their clerks and drivers with copies.

The front page carries the Independent "Shield" and motto, and the left hand inside page is used to advertise the company's service, the principal items being "Rates Reasonable—Good Service—Try our Service to Kansas City; direct copper metallic lines connect with 19,000 telephones in Greater Kansas City." This method of advertising is the idea of Manager H. C. Todd. Mr. Todd is a firm believer in advertising and at the convention saw to it that other attendants got posted on what a good place Maryville is. That it is a place where good things are produced is shown not only by the quality of Independent telephone service, but by a most artistic pillow exhibited, bearing the Independent "Shield," which was the work of Mr. Todd's sister. Not only was the idea highly praised by all who saw it, but the workmanship was such as to bring the ladies at the convention forward with an applause of "Oh's" and "Ah's" and all manner of complimentary phrases.

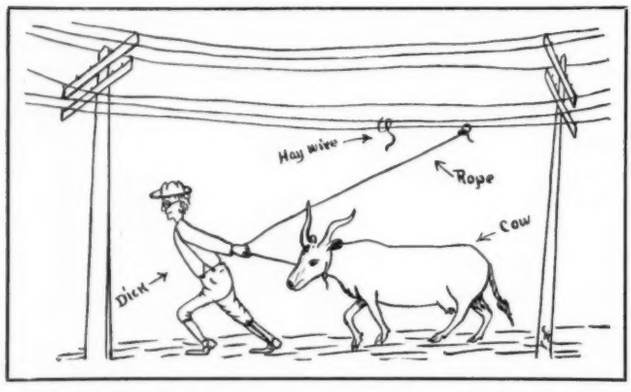
Letters on Practical Subjects

Cow Takes Temporary Position in Maintenance Department.

Here is a little story I want to tell about a "trouble-shooter" who used a cow to help him clear up a piece of trouble.

Dick Thew is a trouble-shooter in the St. John's suburb of Portland, and he is, of course, up against all regular kinds and some unusual types of troubles.

One day, not long ago, Dick was sent out on a "P.S.", and soon located a piece of hay-wire across the circuit in trouble,



Our Contributor's "Snap-Shot" of Dick and His Helper.

out in the middle of the span. He went up one of the poles and tried to shake it off, but the more he shook, the tighter it seemed to stick. Dick was "up against it," but he's a Yankee and soon spied a cow some distance off, tied to a long rope. Now Dick wanted that rope for a few minutes, and wanted it bad, but he didn't have any particular use for the cow. However, he saw no way of borrowing the one without taking the other, unless he turned her loose, and that wouldn't do. So he borrowed one end of the rope, which was all he needed and—well, of course, he was not supposed to know there was a cow on the other end, anyway—carried it up the pole, tied it to one of the wires, came down, led the cow to the next pole, went up and took off the wire and rope, returned the cow and rope to the place from whence they came, and there you are.

Dick's married now—got married last week. That's how I happened to find out about the cow. Dick told his wife, his wife told my wife and my wife told me.

Here is a snap-shot of the method of clearing the trouble.

Portland, Oregon. G. C. S.

Boy Grounds Line Through Peach Can Receiver.

Following is my experience in locating and removing a ground that was quite out of the ordinary, and caused me quite a bit of trouble and worry.

The system of which I am manager consists of a number of rural party lines and one long-distance line, which enter into my residence, where we use a wall switchboard and a telephone as our exchange equipment. A few weeks ago I received a request from one of our subscribers to discontinue his service. Being in the business to accommodate my patrons, I very readily acceded to his wishes, and soon had his telephone removed. Thinking, however, that the people had just grown a little dissatisfied, and would want their telephone back again in a few days, I simply removed the instrument and let the drop and ground connection remain attached to the house. In removing the duplex I gave it a pull from the inside, breaking it loose from the outside wire, but leaving about two inches attached to the drop and ground wire. I was careful, however, to see that the two short pieces were left with ends separated, so as not to cause trouble if let alone.

All went well for a month, when one night on returning home my wife informed me that one of our lines was in trouble. A few turns of the generator told me that the line in question was heavily grounded. Not a telephone on the line could be called. I spent a good part of the night trying to settle in my mind how and where such an unusual ground could be. The next morning, I received a pointer which guided me to the house from which the telephone had been removed, and here I found the trouble. Someone had told a boy member of the family that if he would attach a wire to the telephone line, and on the end of this wire suspend a tin can, he could hear what passed over the line. So he proceeded to try the plan by taking the two short ends of the house wire I had left, and twisting them together and tying to them a piece of wire. This he had run into the house, and fastened his peach-can receiver to it. What he heard was mighty little, but what he did for our telephone line was enough.

Ganse, Texas. W. E. German.

Faulty Workmanship on Transmitter Makes Noisy Line.

We were troubled with a noisy telephone on a grounded farmers' line, which for some time baffled the efforts of the troubleman. Finally, making a careful examination, he discovered the trouble to be in the transmiter. The damping spring is made in the usual way, with a rubber band around the end, and a small square of felt cloth between the rubber and the surface of the diaphragm, fastened to the rubber with some kind of liquid glue.

In assembling the parts, the workman had allowed a small drop of the glue to run down over the felt, and rest against the surface of the diaphragm. Whenever the diaphragm vibrated the piece of hardened glue rattled against it, producing an indescribable sound, compared to which the cannonade of Valmy or the outbreak of the Messina earthquake are feeble noises. But the removal of the offending glue cured the trouble completely.

Vincent, Iowa. G. C. Anderson,
Manager, Vincent Telephone Co.

Telephone Patents

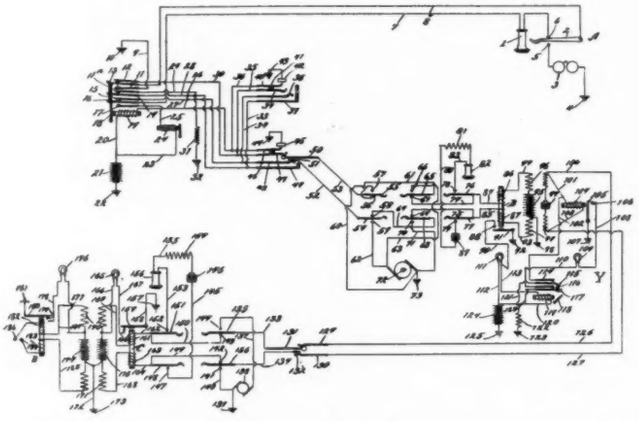
Conducted by Max W. Zabel

SIGNALING MEANS FOR TELEPHONE SYSTEMS.
F. S. Davenport, Atlanta, Ga., patent 923,499, June 1, 1909.

The signaling arrangements of this patent comprise a magneto bell at each substation in series with the condenser bridged across the line. At the central station a common battery is bridged across the lines through the interposition of impedance coils. At each substation, also, there is an interrupter which, periodically, when it is rotated by a crank by the operator, serves to short circuit the line, thereby to charge and discharge the condensers in the various magneto bell circuits, so that these charges and discharges will operate the bell. It is claimed that this device acts as satisfactorily as a generator.

TELEPHONE SYSTEM.
A. H. Dyson, Chicago, Ill., patent 923,035, May 25, 1909; assigned to American Electric Tel. Co., Chicago.

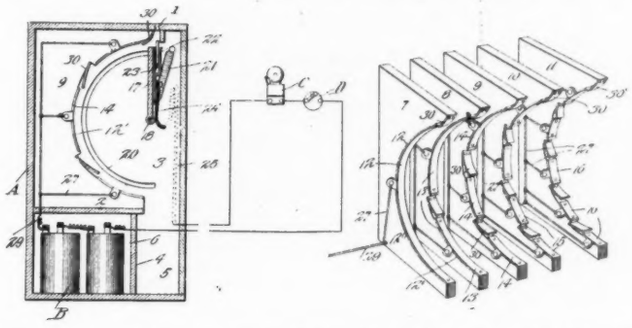
The trunking cord circuit of this patent, as shown in the illustration, includes the originating operator's equipment, which is connected with the jack 132, which by means of the trunking circuit 126, 127, is connected with a plug and cord circuit, terminating in the plug 50. As shown, the parties are talking. When the called subscriber hangs up his receiver, the line is grounded. The establishment of this grounded circuit energizes relay *B*, thereby cutting out the



coil 87, operates relay 119, and thereby closes a local circuit through the lamp 111, advising the trunk operator that the called subscriber has hung up. A second local circuit is closed when the relay 119 operates. This local circuit, through the agency of other instrumentalities, operates a supervisory lamp 165, indicating both to the trunk operator and the originating operator that a disconnection is to be made. When the calling subscriber hangs up, lamp 109 is operated, whereupon the originating operator withdraws her cord circuit and operates the lamp in front of the trunk operator, who disconnects the circuit.

TELEPHONE PAY STATION.
T. H. Roland, Huntington, W. Va., patent 922,045, May 18, 1909; assigned 1/5 to Abraham Tweel, Huntington.

This toll box has a rotatable carrier 17, which is provided with a plurality of springs 23, arranged throughout the



length of carrier 17, in pockets 22, which are adapted to hold coins of different sizes. When a coin is inserted, a handle which projects through the slot 20 of the toll box is rotated to operate the carrier through 180°, whereupon the coin touches contact plates 13 or 14, as the case may be, depending upon which slot the coin is in, and is prevented from coming back by the springs 30. After the carrier has been rotated around through its entire cycle, the coin drops into the coin box 5. Each coin makes a different number of contacts. A nickel makes one contact with the strip 12, a dime two contacts with the strips 13, a quarter three contacts with the strips 14, and so on, thus apprising the operator whether the proper coin has been deposited.

TELEPHONE APPARATUS.
W. H. Taylor, Stamford, Conn., patent 923,603, June 1, 1909.

In order to supplement the receiving apparatus of an ordinary telephone, there is used in this patent, in connection with the ordinary hand receiver, an operator's head receiver, connected in parallel so that one can be used for each ear. At the same time, supporting means are provided upon the desk telephone for supporting the operator's receiver.

In the Manufacturing Field

Unique Improvement in Dry Cell Construction.

A radical mechanical improvement in the construction of dry cells is that invented by Walter S. Doe, to whom patents have been recently granted by the United States and several foreign governments.

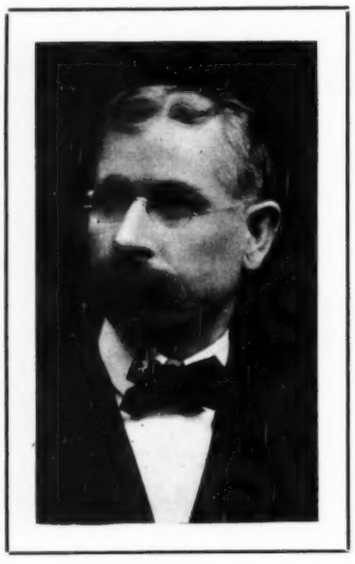
The device is a zinc reservoir, perforated around the lower edge, inserted near the top of the dry cell between the sealing wax and the black mixture. It performs several distinct functions, and tests to which thousands of them have been put during the past fifteen months indicate that the device is a real "life preserver," as it is called.

One of the principal advantages of the invention is that it permits considerable expansion of the electrolyte, hence more solution can be put into the cell than has been possible heretofore without any danger of its breaking the seal and destroying the utility of the cell.

The excitant fluid enters it during expansion and returns to the cell for further service when it contracts. Thus the need of an absorbent material is eliminated and the solution is not lost. Another striking advantage is that the reservoir itself adds three square inches of zinc surface to the cell. The results of these features produce a high voltage, in-

crease the recuperation and materially lengthen the life of the cell.

The inventor, Mr. Walter S. Doe, has had a wide battery experience. Although but little over fifty years of age, he has been interested in batteries for forty years. They have been the hobby of his life. The story of his devotion to

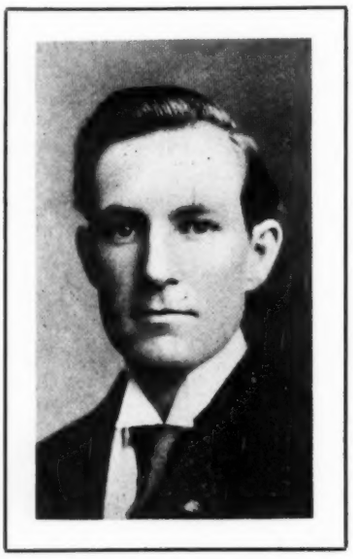


Mr. Walter S. Doe.

them from the time he made his first one at the age of twelve until his present triumph, reads like the romance of genius.

His first battery in youth was made out of a tomato can. The initial ones of his present construction were made at home nights. He often worked till one or two o'clock in the morning, holding in his lap the anvil on which he did his tamping so as not to disturb the members of the household. Such industry, enthusiasm and concentration of effort to make the best dry cell in the world, would scarcely fail to win.

Since like attracts like, it is not surprising that this man with an inventive and investigating turn of mind should be



Mr. Jos. J. Devney.

found working side by side with Edison. While still a young man he spent nearly five years with him personally in his experimental room at his Menlo Park laboratory. Doe not only learned much from Edison, but was able to give him a few pointers in return, several of his ideas being adopted in working out electrical problems.

Doe's whole life and energies have not only been devoted to electricity and chemistry, but many years have been spent right in the telephone field, as he has been in the employ of some of the largest telephone companies in connection with work on their batteries. For several years he was engaged as battery expert by the New York Telephone Company. Among his duties was to initiate new men into the knowledge and care of them. Many of his improvements have been adopted in the telephone industry and "Doe's Commutator Compounds," which are used extensively throughout the United States and England, as well as "Doe's Plug Burnishing Paste," are also products of his chemical skill.

The present improved dry cell is not the first time Doe has made a radical improvement in batteries. Years ago he invented a small battery for lighting which became popular on bicycles in the early days of their reign. So meritorious was this invention that the patents were sold for $20,000.

About three years ago he was engaged by the Manhattan

The Doe Battery Life Preserver.

Electrical Supply Company as expert chemist at its factory at Ravenna, Ohio. His work here consisted largely in examining dry cells of every make and added much to his already extensive knowledge of the business.

After fulfilling his contract, Mr. Doe decided to organize a company and make a battery of his own, using the life preserving device on which he had been working in his own laboratory for a long time. Fortified with this and the vast fund of information, experience and chemical discoveries he had made in nearly forty years' devotion to the subject, he was able to make a dry cell which his tests convinced him had such remarkable superiority that he experienced little difficulty in interesting the Mayor and several other prominent professional and business men of Ravenna in investing ample capital to manufacture them.

Factories were located at Kent, Ohio, and after several months more were spent experimenting and bringing the new cell to a state of perfection, the Doe Battery & Mfg. Co. began to manufacture its product for the trade the latter part of last year. The batteries proved so satisfactory, and the business grew so rapidly that the company found it expedient to organize a sales department. Offices have been opened recently at Cleveland, with Jos. J. Devney in charge as Sales Manager.

While quite a few telephone companies have been using the cells for the past few months with great satisfaction, the company's energies have been devoted largely to the ignition field. Mr. Devney, however, has decided to adopt

a new policy. Realizing that no class of trade uses dry cells so intelligently and none appreciates exceptional merit in them more than those engaged in the telephone industry, he has decided to cultivate this field assiduously. Mr. Doe's intimate knowledge of the requirements of the telephone service is already being utilized in making cells specially constructed for the particular needs of telephone service. These are known as the "Doe Dry Cells."

Mr. Bayard S. Stewart Joints Sales Organization of Standard Underground Cable Company.

In joining the sales organization of the Standard Underground Cable Company, Mr. Bayard S. Stewart brings to his new work a varied experience which enables him to appreciate the needs of customers, and assist in the practical solution of their difficulties. He is a graduate of the Williamson Trade School, of Delaware county, Pennsylvania. His experience includes three years as engineer with the American Railways Company, at Philadelphia; four years as salesman and sales manager of the Moore Electric Company, Newark, N. J., and two years with W. S. Barstow and Company, New York, as sales engineer.

Mr. Stewart will make his headquarters at the Chicago office of the company.

Western Economist Telephones.

The Western Telephone Manufacturing Company, of Chicago, reports a continuance of substantial orders for its "Economist" telephones. One of the reasons for this success is, undoubtedly, due to the admirable method in which the feature of accessibility is worked out in this telephone. The dry batteries are mounted upon a movable shelf, which also carries near its front edge the switch-hook, in a position where its springs are not only absolutely open to inspection, but are as readily accessible, in case tools have to be used upon them, as one could conceive of making them. This arrangement not only makes the cabinet very compact, but possesses the desirable feature of bringing all the wiring down in front throughout the set.

The Western Telephone Manufacturing Company tells its

The Economist Telephone.

customers that "any man with a 10-cent screw-driver, a pair of hands and one good eye can make any repairs ever needed on an Economist telephone."

ALFRED F. MOORE has established a sales agency with Mr. Frank W. Pardee, 56 Fifth avenue, Chicago, Ill. Mr. Pardee has been connected with the telephone and electric business for about twelve years and is very well and favorably known. In addition to the large stock of insulated wire, telephone cords, etc., carried at the Moore factory, 200 N. Third street, Philadelphia, the firm expects to carry a stock with Mr. Pardee, 56 Fifth avenue, Chicago. Alfred F. Moore's concern is one of the oldest manufacturers of insulated wire in the country, and it will doubtless be gratifying to many western companies to know that they can obtain from Chicago stock Moore's standard line of telephone receiver cords, switchboard cords, switchboard wire, jumper wire, Junior jumper wire and other classes of Moore's goods, so well and favorably known.

Handy Troubleman's Wrench.

Mathias Klein & Sons Company, of Chicago, have recently put on the market a wrench especially adapted for use on terminal nuts in various parts of telephone instru-

The New Klein's Instrument Wrench.

ments, including receivers, binding posts, etc. There are three different side openings, with dimensions as follows: 3/8 in., 5/8 in. and 7/16 in., which will engage either square or hexagonal nuts. One end is bent at an angle of 45 degrees, to allow its use in confined places. The total length of the wrench is 2 13/16 ins. The accompanying illustration shows the actual size of the wrench.

THE VOTE-BERGER COMPANY, of LaCrosse, Wisconsin, is a steady-going concern, which jogs along at a comfortable gait, making good goods and selling them in a good way to good people; so its recent circulars sent out under a danger signal have attracted quite a lot of attention. But don't be too much alarmed. The point simply is that the company has, in its cut-out lightning arrester, a device which keeps subscribers out of danger. To the telephone man the danger apparently lies in not purchasing it, for the manufacturer gives an instance where a subscriber was awarded $6,000 damages because of injury arising from the fact that the company had not provided a proper lightning arrester on his line.

The company seems to have picked out the names of a lot of extravagant people for its mailing list as it is trying to scare them into saving money. The "danger" circular carries a folder on "economy" which, it is claimed, can be secured by the use of the D. & T. anchor, having a "maxi-holding power per pole per dollar."

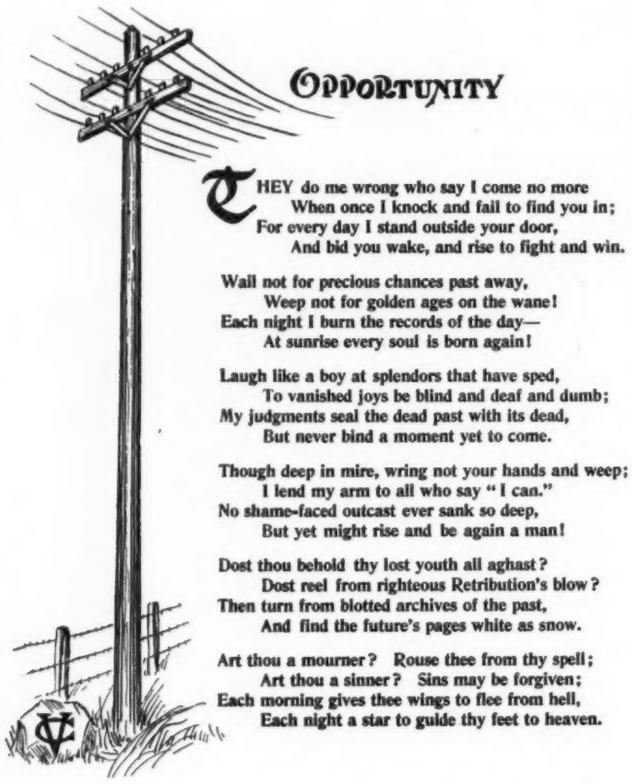
THE HOYT ELECTRICAL INSTRUMENT WORKS, of Penacook, N. H., announces that on account of its rapidly increasing business, it has found it necessary to secure more room for its New York office. It removed its New York city offices, on June 1, to 136 Liberty street, where it has greatly increased facilities which will enable it to give the best possible attention to its business.

FRANK W. PARDEE has accepted the sales agency for Alfred F. Moore, Philadelphia, and expects to carry in Chicago stock a full line of Moore telephone supplies and wire. Mr. Pardee's many friends will doubtless be gratified to know that he has added these standard lines.

THE CENTRAL ELECTRIC COMPANY, of Chicago, has just issued a price list applying to its 1909 catalog No. 26, giving prices and discounts for its extensive line of wire, tools, and supplies for telephone companies.

An Attractive Card.

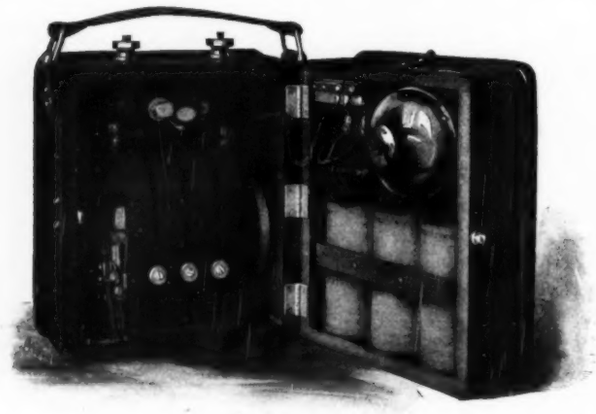
The Valentine-Clark Company, of Chicago, Ill., dealers in cedar poles, recently sent out to its friends and patrons a card which is reproduced below. The verses are written by Hon. Walter Malone of Memphis, Tenn., as a reply to John J. Ingalls' "Opportunity." They are printed in dark


OPPORTUNITY
THEY do me wrong who say I come no more
When once I knock and fail to find you in;
For every day I stand outside your door,
And bid you wake, and rise to fight and win.
Wail not for precious chances past away,
Weep not for golden ages on the wane!
Each night I burn the records of the day—
At sunrise every soul is born again!
Laugh like a boy at splendors that have sped,
To vanished joys be blind and deaf and dumb;
My judgments seal the dead past with its dead,
But never bind a moment yet to come.
Though deep in mire, wring not your hands and weep;
I lend my arm to all who say "I can."
No shame-faced outcast ever sank so deep,
But yet might rise and be again a man!
Dost thou behold thy lost youth all aghast?
Dost reel from righteous Retribution's blow?
Then turn from blotted archives of the past,
And find the future's pages white as snow.
Art thou a mourner? Rouse thee from thy spell;
Art thou a sinner? Sins may be forgiven;
Each morning gives thee wings to flee from hell,
Each night a star to guide thy feet to heaven.

green with the pole and wires in brown, upon white paper, which is attached to a stiff brown card. It makes a neat and attractive addition to the walls of any office, there being no advertising visible, as the name of the donor is printed on the card under the white paper.

A Portable Telephone and Test Set.

There has long been a demand for a test set or portable magneto telephone in which the essential feature was strength rather than lightness. Too often test sets have been de-



Interior View of the Monarch Portable Telephone and Test Set.

signed with lightness as their chief aim, and strength has been sacrificed. The man who has tried to test a long and heavily loaded bridging line and found his generator too light to call the exchange, or his talking set inefficient for satisfactory results, knows that lightness at the cost of reducing the efficiency of his set is not always desirable.

Recognizing the demand for a strong portable set, the Monarch Telephone Manufacturing Company designed the instrument shown in the illustration. Although the box is small, it contains all the standard parts of a powerful bridging telephone. Owing to the way space is economized by the ingenious arrangement of the parts, any size of Monarch generator—even a five bar—can be installed. The talking set is not a miniature, but is full size and as perfect as the operators' sets at the exchange. The transmitter is a standard Monarch transmitter—exactly the same as used for long-distance work. The receiver is an operator's standard watch-case receiver. The buzzer is the same type as the regular Monarch ringer, and the switching springs are the same as used in a standard hook-switch.

When the small door in the front of the box is closed the batteries are cut off automatically, as the door actuates a plunger which operates the switching springs. This arrangement makes it impossible to use up the batteries when the talking set is not in use.

While there has been a considerable demand for this portable telephone from exchange men, there has also been a large demand from the power companies in the extreme West, where

Front View of Portable Set Ready for Use.

it is necessary for a lineman to carry a complete telephone on horseback to enable him to communicate with headquarters. Ranchmen have also found the instrument convenient for connecting temporarily with the telephone line.

Mr. F. J. Dommerque.

Franz Joseph Dommerque was born November 26, 1861, at Duisburg, Germany, and is descended from a family which left France to escape persecution at the time of the Revolution of 1789. After receiving a complete classical education he entered in 1880 the Mathematical Institute of Zurich, Switzerland. Here, under Moellinger and at the Polytechnicum under Fiedler and Frobenius, he studied higher mathematics until 1882, when he entered the German army to perform the legal compulsory service of one year as volunteer. Leaving his regiment at the end of the year with the rank of lieutenant of the reserve, he followed the mechanical engineering course at the Technical University of Munich until 1886, supplementing the instruction there received by practical work in the shops of Hartmann & Company, builders of steam engines, at Offenbach-on-the-Main.

At the beginning of 1887 Mr. Dommerque went to England for the double purpose of learning the English language and of gaining a close view into British technical development. During his stay in England he drifted into electrical engineering, with the Schmidt-Douglas Electric Company of Bradford. This was during the pioneer days of electric lighting in England, and having to rely entirely upon his own resources,

he obtained through this connection a practical education in the design, installation and operation of electric light plants. A desire to see America, with its greater progressiveness, brought him to Chicago at the end of 1888, where he began as a draughtsman for the Western Electric Company. A year later he joined the Thomson Electric Welding Company, of

Mr. F. J. Dommerque.

Lynn, Mass., where he participated in the development of electric welding machinery. In 1890 he took up electric railway work with the United Electric Traction Company of Jersey City, N. J., and a year later added to his already broad electrical experience by engaging in the design of small electric motors in the works of the Singer Manufacturing Company at Elizabethport, N. J.

In 1892 he returned to Germany with the intention of devoting his future years to the manufacture there of electric machinery, but soon missing the enterprising and busy life of the American engineer, he severed home ties for the second time and returned to Chicago as representative of Allweiler & Company at the World's Fair of 1893.

At the close of the fair, Mr. Dommerque accepted an offer to enter the engineering department of the Chicago Telephone Company, where during the next six years he added his share to the development of telephone engineering, devoting himself principally to original investigations on the economical design of large telephone plants, where his mathematical training came in good stead. During his residence at Lynn, when studying alternating current phenomena, he had realized the advantage afforded by the application of imaginary quantities to alternating current work, and while with the Chicago Telephone Company he commenced a series of articles in Electrical Engineering on "Elements of Complex Quantities and Vectors with Reference to Their Use in Alternating Current Work." The series, however, was never completed; first, because the magazine changed its editorial policy; and second, because the appearance of Mr. Steinmetz's classic work on "Alternating Current Phenomena" made continuation superfluous. As a result of this contribution he was elected to membership in the International Association for the Promotion of the Study of Quaternions and Allied Subjects of Mathematics.

In 1899 Mr. Dommerque joined the engineering staff of the Kellogg Switchboard and Supply Company, of Chicago. The first years in his new position were taken up with outside engineering, principally in the planning and supervision of switchboard installations, and later his knowledge of operating engineering was put to good service in the commercial engineering branch. In this capacity he became familiar with all important telephone plants from the Atlantic to the Pacific, and made four extensive business trips to Europe, and one to South America. During this period also he wrote extensively on the subject of telephone engineering.

In the fall of 1903 Mr. Dommerque was appointed secretary of the Kellogg Switchboard and Supply Company. Since that time he has continued his commercial engineering work besides supervising all foreign patent cases for the Kellogg company.

He has been a member of the American Institute of Electrical Engineers since 1896.

Prior to the reorganization of the Kellogg company, Mr. Dommerque resigned with the intention of returning to Europe permanently, but after being persuaded by his many friends in this country to remain, he accepted a position with the Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., as general representative. Mr. Dommerque will act exclusively in the interests of this company in an engineering and advisory capacity, and should form a very strong association between the customers and the company.

The executive officers of the Stromberg-Carlson Telephone Manufacturing Company at Rochester, N. Y., announce that Mr. Dommerque has recently established his headquarters at Rochester, and that the company would be glad to receive any application from its customers for his services in conjunction with any business transaction where he may be useful to them.

Geo. B. Pratt Becomes a Dean Salesman.

George B. Pratt has lately been engaged by the Dean Electric Company to cover western Pennsylvania and New York state.

Mr. Pratt has had extended experience in operating, in manufacturing, and in selling telephone apparatus. He first attracted attention by building the Brockport, N. Y., exchange when he was only eighteen years old. Later he was in the manufacturing departments of the Sterling Electric Company, and then he sold equipment for the Eureka

Mr. Geo. B. Pratt.

Telephone Manufacturing Company, with which company he spent three years.

Mr. Pratt has just completed seven years' successful work in the sales department of the North Electric Company. His acquisition adds considerable strength to the Dean organization.

A New Little Cone.

Under this caption, Mr. F. W. Pardee, 58 Fifth avenue, Chicago, is calling attention to a new and clever device which he is manufacturing and marketing, namely, the "Paragon Ground Cone." The connection between the infant son of Mr. Cohen and Pardee's new infant device may not be apparent at first sight, but the manufacturer says it's there.

The Paragon ground cone is a pure copper cone, perforated to allow the entrance of moisture. The cone is filled with charcoal and this charcoal absorbs moisture from a great distance; the moisture thus attracted keeps the earth around the cone damp all the time, insuring a perfect and permanently moist ground. It is a well-known fact that distributing frames and protector frames ought to and must be grounded, and it is also a general practice to ground pole cable terminals and large toll line arresters. Many companies also ground the messenger and the cable sheath, and for all of these purposes the Paragon ground cone is said to be ideal.

It has been the practice to buy large sheets of pure copper or old copper boilers, which were cumbersome and very expensive, dig a large "grave," which took considerable time, and therefore was costly, and bury the sheet or boiler, filling the hole with charcoal or coke. Grounds thus made have been estimated to cost all the way from $3.00 to $9.00, depending somewhat upon the quantity of copper used and also on the difficulties encountered in digging the grave.

The new Paragon ground cone does away with practically all of this expense and at a cost that is claimed to be ridiculously low. The cone is very easy to install—it is necessary only to bore a post hole and drop it in; also the cone can be buried to a much greater depth than the copper sheet or boiler, and at practically no extra expense.

The cone is made in one-foot and two-foot lengths. The one-foot cone furnishes ample surface for grounding distributing frames or switchboards up to 100 pair capacity. The one-foot cone is also recommended for pole cable terminals of any size, for grounding the sheath or messenger and for toll line arresters. The large or two-foot cone is

The New Paragon Ground Cone.

adapted for use on frames or switchboards up to 1,000 lines and for larger frames the cones are generally used in batteries; that is, several leads are run off from the ground wire and each attached to a cone, or else several ground wires are run, each one ending in a Paragon ground cone.

A hollow, braided copper cable runs entirely through the cone as shown in the cut. This cable is made hollow so that the ground wire can be inserted and pushed right down to the bottom of the cone; then by simply pulling the cable it closes tight around the ground wire in somewhat the same manner as a cable come-along closes and pulls on the cable. The ground wire should then be soldered to the cable around the top of the cable and a perfect connection will then be absolutely assured.

Many telephone companies also put coke around the outside of the cone when burying it, but in most soils this is not necessary.

The Paragon ground cone has already been adopted by a large number of telephone companies and also electric light, power and traction companies.

Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued and any items of interest as to their plants and systems

PERSONAL.

MR. J. F. SHUMAKER, of Burlington, Kan., has been made manager of the Coffey County Telephone Company at Waverly, Kan.

MR. HENRY L. SUTHERLAND, formerly local manager of the Interstate Telephone Company's exchange at St. Johnville, N. Y., has been promoted to the position of assistant general manager of the same company.

MR. E. G. KNIGHT has been appointed manager of the Home Telephone Company's exchange at Bellingham, Wash., to fill the vacancy left by the resignation of J. B. Middleton, who has been placed in charge of the company's exchange at Tacoma.

MR. J. B. MIDDLETON, for the past three years manager of the Independent company at Bellingham, Wash., has been appointed secretary and manager of the Home Telephone Company at Tacoma, Wash., to fill the vacancy caused by the resignation of Charles L. Zahn, who has entered another field of work.

NEW COMPANIES.

OLIVER, GA.—The Farmers' Telephone Company was organized here recently and R. D. Farr has been chosen president; O. H. Marsh, vice-president; Dr. H. E. Ezell, secretary and treasurer. Mr. Ezell will also assume the management of the system.

MODESTO, ILL.—The Modesto Telephoe Company was recently organized with a capital of $7,000. August Zeimer, R. L. Conlee and C. Van Winkle are the incorporators.

NEW HAVEN, ILL.—The New Haven Toll Company was recently organized by several Mt. Vernon, Ill. citizens. The company intends making connection with this city by the 20th of June. John Thieman is president, Benj. Bieker, secretary and C. G. Becker, treasurer of the new organization.

NEW MINDEN, ILL.—The New Minden Mutual Telephone was incorporated with a capital of $2,400 by H. W. Meinert, C. G. Rinne and W. C. Colimeyer.

WOODHULL, ILL.—About sixty residents of Woodhull at a recent meeting in response to a call by the city board of trustees, organized a telephone company to be known as the Woodhull Village Telephone Company. This step was taken because of the need for better telephone service in the village. W. C. Stickney is president; S. W. Howell, vice-president; Geo. E. Swanson, secretary, and A. A. Mackey, treasurer. A. W. Mansfield, W. G. Larson, John M. Anderson and Fred J. Kellogg are the directors.

FOWLER, IND.—The Indiana Union Telephone & Telegraph Company has been chartered by the Secretary of State to operate telephone lines in Benton, Warren, White, Jasper, Newton, Lake and Porter counties. The company is capitalized at $100,000 and the directors are F. A. De Peyster, C. L. McNaughton and D. P. Williams, all of Indianapolis.

RUSHVILLE, IND.—The Lot Green Telephone Company has been incorporated with a capital stock of $11,000. The company will operate lines and exchanges in Rush county. The directors are Henry Schrader, Amos Blackidge, Thos. A. Dill, Chas. A. Parsons and Samuel Newhouse.

BROWNVILLE, ME.—The Brownville Telephone Company has been incorporated with a capital stock of $5,000. Edwin W. Johnson is president and treasurer of the new company.

CADILLAC, MICH.—The R. G. Peters Salt & Lumber Company and farmers in the vicinity of East Lake and Hoxieville are constructing a new Independent telephone line between these two places. The new organization is to be known as the Hoxieville & East Lake Telephone Company.

CHINOOK, MONT.—Articles of incorporation have been filed by

Rudolph Hermes, John Brummer, James N. Cook, W. D. Smotherman and R. L. Morris for the Co-operative Telephone Company. The company is capitalized at $40,000 and a telephone system will be built from Chinook to Paradise Valley.

DORSEY, NEB.—The Dorsey Telephone Company has been incorporated with a capital stock of $3,000 by D. D. Miles, William Carson, John T. Brady and others.

CALABASH, N. C.—The Southport & Little River Telephone Company has been chartered to operate lines between Little River, S. C., and Southport, N. C., the principal office to be at Calabash. The company is capitalized at $10,000. M. J. Corbett, M. W. Divine and R. R. Stone are interested in the new company.

GIBSONVILLE, N. C.—A charter has been granted the Gibsonville Telephone Company of this city. The capital stock is $5,000 and G. E. Jordan, J. V. Dieke and others are the stockholders.

BISMARCK, N. D.—The Rosebud and Youngtown Telephone Company has been organized and will connect with the North Dakota Independent Telephone Company at New Salem. Robert Rusch has been elected president of the new company, Charles Klusman, treasurer; John Holle, secretary and Frank Schnelling and Henry Sullivan, directors. About thirty miles of line, the material for which has been ordered, will be constructed and work will be commenced as soon as possible.

McCLUSKY, N. D.—The Lamont Telephone Company has been incorporated by Emanuel J. Klundt, Jacob Triebwasser, John H. Regier and others, with a capital stock of $4,000.

ALVA, OKLA.—The Independent Telephone Company has been chartered with the following directors: G. J. Lenherr, L. T. Fullerton and W. B. Marcum. The capital stock is placed at $900.

HOLLISTER, OKLA.—A Mutual telephone company, to be known as the Hollister Mutual Telephone Company, has been organized to operate lines in the southwestern part of Greer county and to establish exchange service at this place. The company is capitalized at $5,000 and the incorporators are J. W. Harrington, C. A. Nider, G. O. Winningham, Walter H. Hayward, H. E. Fisher, Samuel Murphy and Gains Roark.

OKLAHOMA CITY, OKLA.—The Crutcho Telephone Company has been incorporated with a capital of $600. The directors are E. A. Wagner, L. M. Warner and G. B. Alguire, all of this city.

BICKELTON, ORE.—(Klichitat Co.) The Farmers' Mutual Telephone Company has been organized here. A combination toll switchboard will be installed, and it is expected the system will be in operation in a very short time. The officers are, J. B. Andrew, president; Charles Wherry, vice-president and Dr. Dodson, secretary and treasurer.

DILLSBURG, PA.—The Dillsburg Rural Telephone Company was recently organized. T. D. Baker is president of the company; T. G. Cooke, secretary, and C. J. Dushey, treasurer. Lines will be built from this place to Mount Top.

FENNELTON, PA.—A new telephone company has been organized with the following directors: F. P. McBride, C. A. Horton, Isaiah Pontius, W. I. Sipe and P. S. Fennel. The officers are: F. P. McBride, president; Isaiah Pontius, vice-president; W. I. Sipe, secretary; P. S. Fennel, treasurer.

HURON, S. D.—The Huron Municipal Telephone Company has been organized with a capital stock of $50,000. The incorporators are F. H. Kent, S. P. Malone, Charles E. Koepp, J. R. Hinman, Charles E. Bryant, William Wiebel and J. W. Campbell.

DRESDEN, TENN.—The Farmers' & Merchants' Telephone Company, with C. C. Wells, president; W. T. Killibrew, secretary-treasurer, and Oscar McClain, Robert Fowler, Robert Harris, J. W. Boyd, B. Melton and Dr. J. B. Finch as directors, has been organized. The company has purchased the equipment of the old rural company which will be entirely overhauled. Lines will be built from Gleason, Sharon, Martin and several other points.

MAGRUDER, VA.—With W. L. Schenck, of Oak Tree, as president; D. A. Powers, Magruder, vice-president; D. S. Harris, Williamsburg, secretary and treasurer; and a capital stock of $3,000, the Bruton Telephone Company has been organized.

CLARKSTON, WASH.—The Alpowa Telephone Company has been organized and has a franchise to build from this place to Alpowa, about nine miles down the river. W. W. Herrick is president; John Ingraham, secretary and T. H. Robinson, treasurer. The two latter of Alpowa.

ALTONA, ONT., CAN.—The Central Telephone Company has been incorporated with a capital stock of $40,000. J. Underhill is secretary of the new organization.

CARIEVALE, SASK., CAN.—The North Carlevale Rural Telephone Company has been organized to build rural lines in this vicinity.

DRUMMONDVILLE, QUE., CAN.—The Drummondville, Telephone Company has been recently incorporated. N. Garceau is one of the parties interested in the enterprise.

FINANCIAL.

MINNEAPOLIS, MINN.—The directors of the Tri-State Telephone Company met recently and declared a quarterly dividend at the rate of 6 per cent per annum.

FRANCHISES.

PARAGOULD, ARK.—The Marmaduke Telephone Company, of Marmaduke, has been granted a twenty-year franchise for the purpose of constructing and maintaining a telephone system in this place.

CONSTRUCTION.

RIDGEFARM, ILL.—The Vermillion Telephone Company is making preparations for the rebuilding of its local system. The work will take several months to complete and cost several thousand dollars.

MICHIGAN CITY, IND.—The Merchants' Mutual Telephone Company has been granted a permit to build a two-story building, which will be used by the company as a stock room.

EARLHAM, IA.—The Hawkeye Telephone Company is completely overhauling its system at this place. Wires are being placed in cables and adds much to the appearance of the streets besides bettering the service. A new switchboard will also be installed soon.

HARLAN, IA.—The Farmers' Mutual Telephone Company is putting in a new line between this place and Irwin. This will make a great improvement in the service furnished.

MARSHALLTOWN, IA.—Work will begin soon on the installation of a new automatic telephone system, to be built by the Independent interests of the state. The work is under the management of A. G. Hawley, of Clinton, Iowa, and will take about a year to complete the construction, costing in the neighborhood of $200,000.

WAUKON, IA.—The Waukon Telephone Company is making arrangements to rebuild its system and exchange.

JEWELL, KAN.—The Jewell County Telephone Company is rapidly pushing to completion the long distance copper line connecting Jewell and Mankato. When completed this line will give Mankato first class connection with Kansas City and all eastern Kansas.

PINE TOP, KY.—The Carrs Fork Telephone Company will build a connecting line with the Hindman Telephone Company, giving connection with Jackson and Hazard. Considerable construction material will be needed for the construction of this extension. Mr. J. T. Smith is manager of the company.

SERGENT, KY.—The Letcher County Home Telephone Company intend dropping the exchange at this place and building the Colly-Ola line into Whitesburg to connect with the lines of the Whitesburg Telephone Company. Mr. W. B. Webb is manager of the Letcher County Home Telephone Company. Considerable construction material will be needed.

WHITESBURG, KY.—N. Starkey is interested in establishing a telephone system here and much construction material will be needed for work which is to be done this summer.

WHITESBURG, KY.—Judge James P. Lewis, manager of the Whitesburg Telephone Company will make several extensions and improvements to the system.

CARIBOU, ME.—The Aroostook Telephone & Telegraph Company has recently installed a new six position switchboard, made necessary by the large increase in the list of subscribers.

ST. LOUIS, MICH.—The Union Telephone Company is making preparations to replace its open wires with cables. The work will cost near to $20,000.

SHELBY, MICH.—The Lake Shore Telephone Company has begun the erection of a new telephone exchange. The building is to be of brick, 20x30. The company is also engaged in replacing the lines damaged by a recent storm with new cable.

HASTINGS, MINN.—The local telephone company has just completed installing the new switchboard in its exchange, which will give very much improved service. The new equipment cost about $15,000. As soon as the new outside wiring is completed, the work of filling new orders for telephones, of which there is a large waiting list, will be commenced.

ALBANY, N. Y.—A certificate of merger of the Southern New York Toll Company with the Independent Union Telephone Company of this place has been filed. The stock of the former company was owned by Irving H. Griswold, president of the Union company, and T. M. Brush, secretary of the company.

LIMA, OHIO.—The Lima or Home Telephone Company has commenced improvements and the construction of new work which will take practically all summer. About $75,000 will be spent on the work. The work embraces about 25 miles of underground conduit. Several thousand feet of aerial cable will be strung in the outlying districts and the new additions to the town which have sprung up recently. The company will likewise erect in a short time a new exchange building on North street, which will possibly cost about $50,000, in which entirely new equipment, including switchboard, terminal and operating equipment, is to be installed.

LIMA, OHIO.—The United States Telephone Company of Cleveland has opened a new circuit between this place and Kenton which will enable the company to handle all the toll business, which is quite heavy, between the two cities.

STEUBENVILLE, OHIO.—The National Telephone Company has commenced the work of installing a new plant at Mingo, which has been contemplated for some time. A common battery system will be installed.

CLINTON, OKLA.—The Deer Creek Telephone Company will soon commence the construction of fourteen miles of telephone line running from Arapaho to Custer City.

BRIDGEPORT, W. VA.—The National Telephone Company is making plans to run a line from Barnesville to Woodsfield. With

the completion of this line direct service will be instituted between Woodsfield and Wheeling.

FORT WILLIAM, ONT., CAN.—The telephone system on the Canadian Pacific Railroad between Farnham and Montreal has proved so satisfactory, for despatching trains, the company has decided to install a similar system between this place and White River, Ont.

ELECTIONS.

PRINCETON, ILL.—The Bureau County Independent Telephone Company held its annual meeting recently and the election of officers resulted as follows: President and general manager, Aaron Dunbar; vice-president, Elmer Sapp; secretary, S. S. Harris; treasurer, C. V. Field. This company has eleven exchanges, with 4,700 telephones, and has toll connections with all other companies. Dividends of 4 per cent are paid semi-annually.

CENTER POINT, IA.—The Center Point Mutual Independent Telephone Company at its annual meeting elected N. J. Zakokrtsky, president; E. H. Cumberland, vice-president; Frank Thompson, secretary and J. W. Holland, treasurer.

GRAND JUNCTION, IA.—The Greene County Telephone Company held its annual meeting recently at which the following officers and directors were elected: President, W. E. Jenison; vice-president, F. E. Gamble; secretary, H. I. Jenison, and treasurer, M. M. Head. With the exception of M. M. Head, these, with L. B. Kinsey, B. F. Osborn, L. H. Roberts, E. G. Jenison, F. M. Dean and G. A. Morris, constitute the board of directors.

DOWAGIAC, MICH.—At the annual meeting of the stockholders of the Cass County Home Telephone Company, directors were elected as follows: L. L. Laurence, Decatur; Henry C. Walker, Cassopolis; W. F. Hoyt, Eugene Gilbert, C. E. Sweet and W. M. Briggs, Dowagiac.

NEW ULM, MINN.—The New Ulm Rural Telephone Company held its annual meeting recently and elected directors as follows: F. H. Retzlaff, Fred Pfaender, F. J. Backer, J. P. Graff, H. P. Bastian and William James, of New Ulm; Jos. Weisner and Herman Fritsche, of Cottonwood; Fred Wellner and Frank Wellner, of Lafayette; Fred Roloff and Wm. Gluth, of Milford; John A. Sellner and Henry Waibel, of Sigel; Alex. Russell and Louis Bushard, of Newton; Fred Foss and N. Reinhart, of Courtland.

SHAKOPEE, MINN.—At the seventh annual meeting of the Shakopee Telephone Company the following officers were elected: President, John B. Reis; vice-president, P. V. Philipp; secretary-treasurer, Dr. H. P. Fischer. Directors, the above with F. W. Goodrich, C. C. Grosshauser, George Palmer, P. J. Schmitz, Ben Anderson and Wm. F. Duffy.

SLEEPY EYE, MINN.—The annual meeting of the Sleepy Eye Rural Telephone Company was held recently and C. P. Cutting was elected president of the company; Arnold Hillesheim, vice-president; Wm. Brust, secretary, and F. G. Ried, treasurer. These with Emil Rasmussen, H. G. Hillesheim, H. F. Dohrman, Andres Losleben and Robert Hose are the directors.

ROCHESTER JUNCTION, N. Y.—The stockholders of the Mendon Center Telephone Company held their annual meeting at this place and elected officers as follows: president, E. H. White; vice-president, William L. Ferry; treasurer; F. E. Ford and secretary, A. E. Price.

STATESVILLE, N. C.—At the annual meeting of the Iredell Telephone Company the old officers were unanimously re-elected as follows: President, Mayor H. P. Grier; vice-president, E. Morrison; secretary and general manager, W. M. Barringer. The directors were likewise re-elected, being H. P. Grier, E. Morrison, P. F. Laugenour, Wm. Wallace, R. V. Strawley, H. A. Yount, J. C. Shelton, R. R. Clark, J. E. King and R. J. Bryant.

ASHTABULA, OHIO.—Stockholders of the Ashtabula Telephone Company have elected as directors for the ensuing year B. B. Seymour, P. C. Remick, S. W. Crosby, W. R. Flower, F. E. Henry, W. H. Morrison, C. D. Latimer, A. T. Ullman and L. T. Carlisle.

CHARDON, OHIO.—At the recent annual meeting of the Chardon Telephone Company officers and directors were elected as follows: President, Dr. Orange Pomeroy; vice-president, F. S. Pomeroy; secretary, W. C. Parsons; treasurer, C. L. Smith; manager, Manley Gilmore. The above with C. L. Smith, R. E. Hovey, and W. W. Sprague constitute the board of directors.

DAMASCUS, OHIO.—The directors of the North Benton-Deerfield Telephone Company met recently and elected Dr. D. J. Miller as president and treasurer of the company; Dr. A. R. Bobbs, vice-president, and Levi Pearce, secretary and general manager.

CHARLEROI, PA.—At the annual election of the Charleroi Telephone Company, the following were elected directors of the company. F. B. Newton, Walter Byerly, R. L. Whitehead and H. L. Lamb were re-elected, and James J. Hoyt, J. E. Van Voorhis and James Shephard are the new members of the board.

AMARILLO, TEX.—Stockholders of the Panhandle Telephone and Telegraph Company met recently and elected as officers for the ensuing year, W. W. Taylor, president; M. C. LeMaster, vice-president and treasurer; H. H. Davenport, secretary and general manager. These with J. E. Nunn and Horace Gooch are the directors.

LLANO, TEX.—The Texas Telegraph and Telephone Company held its annual meeting recently and officers and directors were elected. C. C. Gibbs of San Antonio was elected president; W. R. Hamby of Austin, vice-president; G. W. Polk of San Antonio, secretary and treasurer and L. C. Henry of Llano, superintendent. Directors are the above with T. M. Hubbard, T. D. Cobbs and S. R. Fisher.

ROSEWOOD, MAN., CAN.—At the annual meeting of the Rosewood Telephone Company, T. F. Morris was elected president; Wm. Norman, vice-president; Charles Clayton, treasurer. and W. C. Morris, secretary.

MISCELLANEOUS.

PRESCOTT, ARIZ.—The Arizona Overland Telephone Company has purchased the franchise from Robert Brow, M. J. Hickey and H. Andrews, for a telephone system. The company will make this place its headquarters for a long distance system in Arizona, New Mexico and California. The total expenditure will possibly be about $250,000.

WINTER HAVEN, FLA.—The telephone system in this place has become the property of Mr. C. H. Eyclesheiner, who will devote his entire time and interests to the development of the company.

BAINBRIDGE, GA.—The Bainbridge Telephone Company has absorbed the properties of the Brinson Telephone Company and the Colquitt Telephone Company. A small exchange is being built at Climax by this company and also many rural lines to all parts of this and Miller counties.

MURPHYSBORO, ILL.—Representatives of various southern Illinois telephone companies met recently and completed the negotiations whereby the Ava and Southern Illinois, the Saline County Telephone, Carterville, Herrin, Johnston City and the Murphysboro Telephone companies are merged. Murphysboro will remain the head office of the company and the company will be called the Murphysboro Telephone Company. Some time ago this company purchased the control of the Ohio & Mississippi Valley Telephone Company, a $100,000 concern, which it is operating as a separate corporation. The company will ask the secretary of state for permission to raise the capital stock from $10,000 to $100,000.

TAMPICO, ILL.—A merger of all the farmers' telephone lines and companies is being agitated at present in Whiteside and Bureau counties. The proposed merger includes the Tampico Farmers' Mutual, the Deer Grove Mutual and the Yorktown, Hooppole and Tampico companies. It is understood that all the companies are highly in favor of the merger, believing that it will give better service.

INWOOD, IND.—Mr. George Long has purchased the telephone plant and system from M. Beck, who built the system and has since owned and managed it.

SEYMOUR, IND.—Ralph L. Roland, receiver for the Seymour Home Telephone Company, is seeking to compel the Brownstown Telephone Company to carry out its contract on long distance business to Seymour. He alleges that the company has broken its contract and is placing its long distance calls with the Seymour Mutual and the Central Union Telephone Companies.

UPLAND, IND.—The Citizens Telephone Company is in a very flourishing condition. Manager Lyons reports that his men are busy most of the time installing new telephones.

BURLINGAME, KAN.—The Independent telephone system of this place has been purchased by F. W. Stine and Marshall Randal.

COLUMBIA, MO.—The Columbia Telephone Company is making many improvements in its system. A new and very modern switchboard is being installed, the cost of which is $20,000. Three cars of copper wire and other material have been received for using in the betterment of the plant.

MADISON, NEB.—The directors of the Madison Telephone Company and the Farmers' Independent Telephone Company met recently and the consolidation of the two was effected. Mr. Otto Fuerst will be superintendent of the new company, and is now making arrangements for the installation of new cables and wires. About $2,000 will be expended for improvements.

DAYTON, OHIO.—The Home Telephone Company has issued its new telephone directory, which will be found to have many new features. This company has been making extensive additions to its system, which is automatic, and it is believed now to be in the best condition. Mr. Ainsworth, the general manager, has been working new reforms, among which is the doing away with free service in drug and cigar stores.

BLANCHARD, OKLA.—Mr. R. R. Gibson, of Norman, has purchased the telephone exchange at Blanchard.

TEMPLE, TEX.—Under the direction of the Federal Court, the Bell County Telephone Company was sold by Judge W. S. Lemly. The system includes the exchanges at this place and Belton. Mr. Glass, acting for H. M. Dougherty, I. B. Cameron and Jos. Brailey, purchased it for $25,000.

DUNRAE, MAN., CAN.—The Municipal council has decided not to construct a telephone system throughout the Municipality of Riverside, the Manitoba Government having agreed to do the work.

UNDERGROUND.

BUTLER, Pa.—The People's Telephone Company has commenced laying part of its wires in underground conduit. It is expected that ultimately all the wires will be placed underground and poles done away with entirely.

ST. JOHN, N. B., CAN.—The New Brunswick Telephone Company has commenced work on its underground construction. One section will consist of eight ducts, one of seven and another of six. The work will cost about $250,000.